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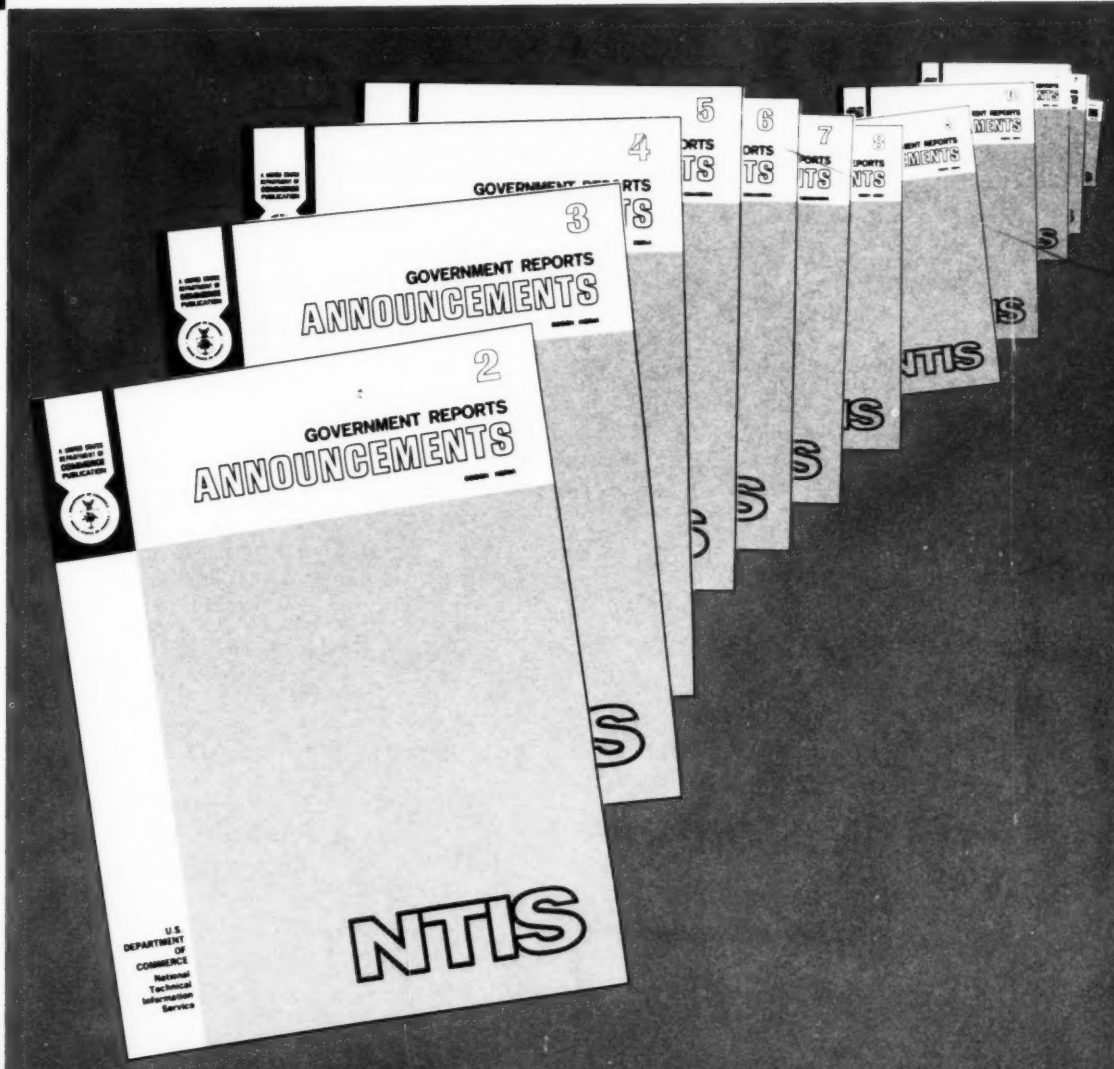

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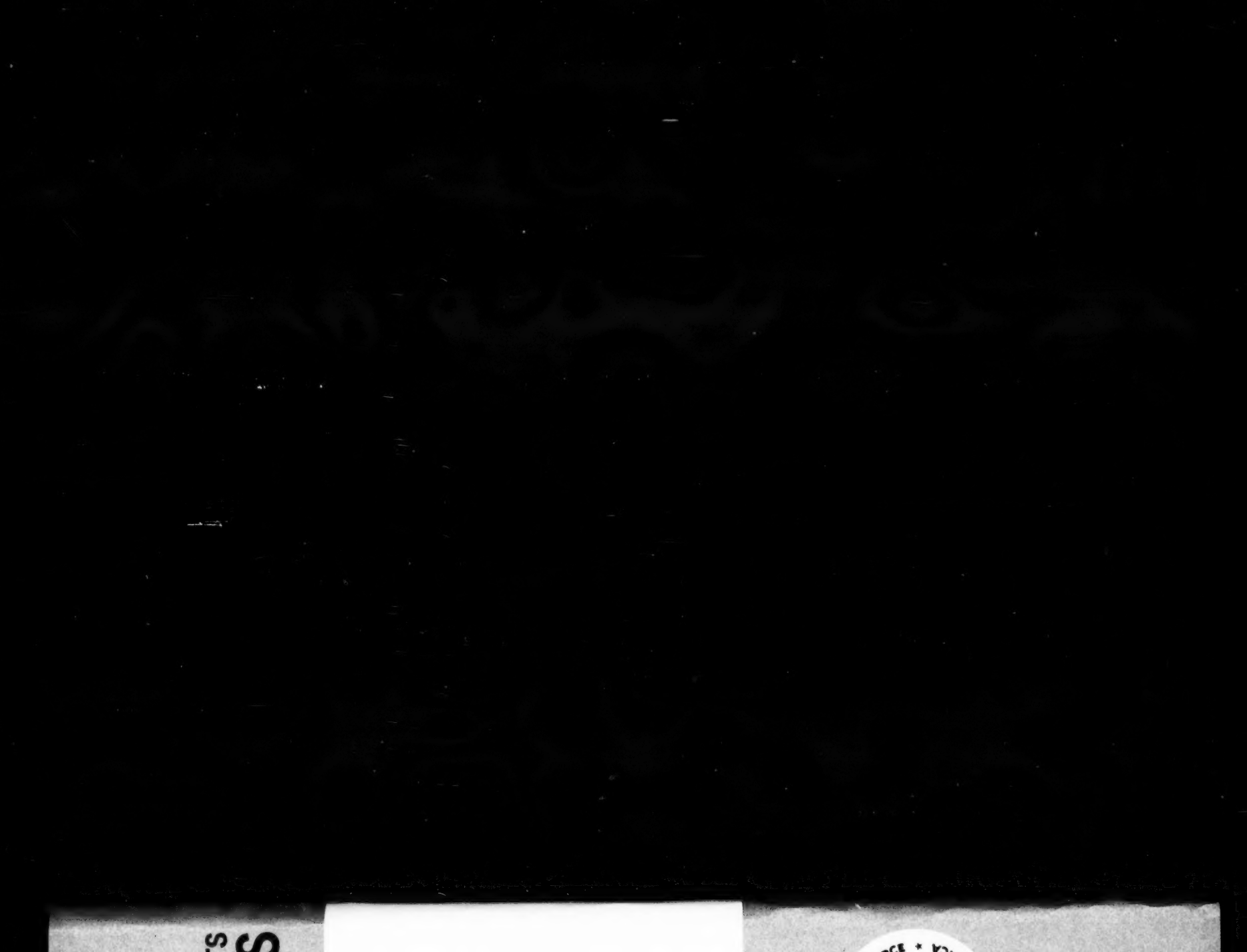

GOVERNMENT REPORTS ANNOUNCEMENTS

Volume 72, Number 24 ◈◈◈ December 25, 1972

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INTRODUCTION

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A "Locator List" at the end of the journal gives the COSATI field group location for each report cited in the issue. This list is arranged by accession number.

An "Edge Index" on the back cover provides easy access to the subject fields within the journal.

Publications available from NTIS on subscription or standing order are listed in this journal quarterly.

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The entry price code also indicates the form or forms in which the report is reproduced. Examples: PC (paper copy), MF (microfiche), magnetic tape (7- or 9-track, odd or even parity), punched cards, or microfilm.

SUBJECT FIELD AND GROUP STRUCTURE

(Use Edge Index on back cover to locate subject field in the Journal)

FIELD 1. AERONAUTICS. Includes the following Groups: Aerodynamics; Aeronautics; Aircraft; Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE. Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS. Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES. Includes the following Groups: Atmospheric Physics; Meteorology.

FIELD 5. BEHAVIORAL AND SOCIAL SCIENCES. Includes the following Groups: Administration and Management; Documentation and Information Technology; Economics; History, Law, and Political Science; Human Factors Engineering; Humanities; Linguistics; Man-machine Relations; Personnel Selection, Training, and Evaluation; Psychology (Individual and Group Behavior); Sociology.

FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES. Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology; Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects.

FIELD 7. CHEMISTRY. Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY. Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING. Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive). Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS. Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES. Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING. Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings, Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT. Includes the following Groups: Cost Effectiveness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES. Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY. Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES. Includes the following Groups: Acoustic Detection; Communications; Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY. Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Non-power); SNAP Technology.

FIELD 19. ORDNANCE. Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS. Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory, Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS. Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY. Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

1. AERONAUTICS

1A. Aerodynamics

AD-750 607 PC$3.00/MF$0.95
National Aeronautical Establishment Ottawa (Ontario)
A SUGGESTED METHOD FOR ESTIMATING PATCH LENGTH FROM TURBULENCE MEASUREMENTS USING RESULTS FROM LOW ALTITUDE FLIGHTS BY A T-33 AIRCRAFT.
Aeronautical rept.,
D. G. Gould, and J. I. MacPherson. Aug 72, 25p
Rept no. NAE-LR-562 NRC-12793

Descriptors: (*Turbulence, Mathematical prediction), Intensity, Jet training planes, Low altitude, Functional analysis, Measurement, Canada.
Identifiers: T-33 aircraft.

When an aircraft encounters a patch of turbulence, the RMS turbulence intensity is usually constant only over a portion of the total period of exposure. A method is suggested for estimating the patch length as a function of intensity for turbulence encounters that have two or more regions of different turbulence intensities. It makes use of the fact that the amplitude or level crossing distributions that fall between the normal distribution and the exponential distribution be closely approximated by a superposition of normal distributions of different intensities. Level corssing distributions of vertical acceleration from a series of T-33 low altitude turbulence research flights are analyzed using this procedure, and results from flatland and hilly lakeland are compared. (Author)

AD-750 933 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
INFLUENCE OF AN ANNULAR JET FLOWING FROM THE PLANE OF A WING ON THE AERODYNAMIC CHARACTERISTICS OF A WING MOVING NEAR AN INTERFACE.
L. F. Kalitievskii, and Yu. F. Usik. 1 Sep 72, 11p
Rept no. FTD-HT-23-785-72
Edited trans. of Teplo- i Massoperenos (USSR) n11 p431-435 1969, by Rene E. Courville.

Descriptors: (*Aerodynamic control surfaces, *Boundary layer control), Flow fields, Wings, Jets, Interfaces, Equations of motion, Mathematical models, Vortices, USSR.
Identifiers: Translations.

The article presents some results of research on the aerodynamic characteristics of a wing moving close to an interface with the presence of an annular jet flowing from the wing surface and impinging on a screen. A similar problem arises during research on the aerodynamic characteristics of a wing-like apparatus on an air cushion. (Author)

N72-27998 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
LOW SPEED AERODYNAMIC CHARACTERISTICS OF A LARGE SCALE MODEL WITH A THIN, HIGHLY SWEPT, 2.67 ASPECT RATIO WING HAVING A CRANKED LEADING EDGE.
D. J. Giulianetti, and R. L. Maki. Aug 72, 44p
NASA-TN-D-6919, A-3893

Descriptors: *Aerodynamic characteristics, *Fighter aircraft, *Swept wings, *Thin wings, *Wind tunnel stability tests, Aerodynamic coefficients, Aerodynamic configurations, Aircraft stability.

For abstract, see STAR 10 19.

N72-28009 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
WIND TUNNEL INVESTIGATION OF A LARGE SCALE 35 DEG SWEPT WING JET TRANSPORT MODEL WITH AN EXTERNAL BLOWING TRIPLE SLOTTED FLAP.
K. Aoyagi, L. P. Hall, and M. D. Falarski. Jul 72, 75p NASA-TM-X-2600, A-3753
Subm- Sponsored in Part By Aardl

Descriptors: *Aerodynamic characteristics, *Jet flaps, *Transport aircraft, *Wind tunnel models, Jet aircraft, Lift, Short takeoff aircraft, Swept wings.

For abstract, see STAR 10 19.

N72-28012 PC$7.25/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
AERODYNAMIC CHARACTERISTICS OF A LARGE-SCALE LIFT-ENGINE FIGHTER MODEL WITH EXTERNAL SWIVELING LIFT--ENGINES.
J. P. Barrack, and J. V. Kirk. Jul 72, 101p
NASA-TM-X-62167

Descriptors: *Aerodynamic characteristics, *Fighter aircraft, *Vertical takeoff aircraft, *Wind tunnel models, Aerodynamic configurations, Data acquisition, Performance prediction.

For abstract, see STAR 10 19.

N72-28019 PC$5.75/MF$0.95
Washington Univ., St. Louis, Mo. Dept. of Mechanical and Aerospace Engineering.
CONCEPTS FOR A THEORETICAL AND EXPERIMENTAL STUDY OF LIFTING ROTOR RANDOM LOADS AND VIBRATIONS. PHASE 6-B EXPERIMENTS WITH PROGRESSING/REGRESSING FORCED ROTOR FLAPPING MODES.
K. H. Hohenemser, and S. T. Crews. Jun 72, 72p
NASA-CR-114481
Contract NAS2-4151

Descriptors: *Aerodynamic characteristics, *Elastic properties, *Flexible wings, *Rotary wings, *Structural analysis, Aerodynamic forces, Numerical analysis, Stress analysis.

For abstract, see STAR 10 19.

N72-28994 PC$3.00/MF$0.95
Nielsen Engineering and Research, Inc., Mountain View, Calif.
CALCULATIVE TECHNIQUES FOR TRANSONIC FLOWS ABOUT CERTAIN CLASSES OF WING BODY COMBINATIONS.
S. S. Stahara, and J. R. Spreiter. Aug 72, 99p
NASA-CR-2103
Contract NAS2-6259

Descriptors: *Air flow, *Compressible flow, *Flow equations, *Transonic speed, Aerodynamic characteristics, Body-wing configurations, Flow theory.

For abstract, see STAR 10 20.

N72-28995 PC$3.75/MF$0.95
Royal Aircraft Establishment, Farnborough (England). Aerodynamics Dept.
AN APPROXIMATE TREATMENT OF THE STABILITY OF A TOWED UNBANKED OBJECT IN A CONDITION OF ZERO LIFT.
H. R. Hopkin. 1971, 33p ARC-R/M-3675, RAE-TR-69076
Misc 0supersedes Rae-tr-69076 Arc-31359

Descriptors: *Aircraft stability, *Lateral stability, *Towed bodies, *Zero lift, Approximation, Equations of motion, Mathematical models.

For abstract, see STAR 10 20.

N72-28996 PC$5.50/MF$0.95
Royal Aircraft Establishment, Farnborough (England). Aerodynamics Dept.
THE TWO-DIMENSIONAL FLOW AROUND A SLOTTED FLAP.
D. N. Foster, H. P. Irwin, and B. R. Williams. 1971, 70p ARC-R/M-3681, RAE-TR-70164
Misc 0supersedes Rae-tr-70164 Arc-32681

Descriptors: *Wing flaps, *Wing flow method tests, *Wing slots, Flaps (control surfaces), Lift, Pressure distribution, Skin friction, Sweptback wings, Wind tunnel models, Wing profiles.

For abstract, see STAR 10 20.

N72-28997 PC$3.00/MF$0.95
National Physical Lab., Teddington (England). Aerodynamics Div.
THE VORTEX DRAG OF A SWEPT WING WITH PART-SPAN FLAPS.
H. C. Garner. 1972, 19p ARC-R/M-3695, ARC-32395
Misc 0supersedes Arc-32395

Descriptors: *Aerodynamic drag, *Swept wings, *Vortices, *Wing span, Aspect ratio, Chords (geometry), Flaps (control surfaces), Lift, Reversed flow, Wing loading.

For abstract, see STAR 10 20.

N72-29226 PC$3.75/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Aeroelastic and Structures Research Lab.
LEADING-EDGE PRESSURE MEASUREMENTS OF AIRFOIL VORTEX INTERACTION.
R. G. Walsh, Jr. Jan 70, 34p NASA-CR-112129, ASRL-TR-153-1
Contract NGR-22-009-303

Descriptors: *Airfoils, *Pressure measurements, *Vortices, *Wing span, Aspect ratio, Chords (geometry), Flaps (control surfaces), Lift, Reversed flow, Wing loading.

For abstract, see STAR 10 20.

N72-29228 PC$4.25/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
NASA AIRCRAFT TRAILING VORTEX RESERACH.
W. A. Mcgowan. 1971, 44p NASA-TM-X-68566
Conf- Presented At the Faa Symp. on Turbulence, Washington, D. C., 22-24 Mar. 1971

Descriptors: *Transport aircraft, *Vortices, *Wing tips, Flight hazards, Flight tests, Lasers, Velocity measurement, Wind tunnel models.

For abstract, see STAR 10 20.

N72-29237 PC$10.25/MF$0.95
Virginia Polytechnic Inst., Blacksburg. Dept. of Aerospace Engineering.
FARFIELD STRUCTURE OF AN AIRCRAFT TRAILING VORTEX, INCLUDING EFFECTS OF MASS INJECTION.
W. H. Mason, and J. F. Marchman, III. Apr 72, 161p NASA-CR-62078
Contract NGL-47-004-067

Descriptors: *Flow stability, *Turbulent flow, *Vortex injectors, *Vortices, *Wind tunnels, Air flow, Flow distribution, Performance prediction.

For abstract, see STAR 10 20.

N72-29991 PC$3.00
National Aeronautics and Space Administration, Washington, D.C.
AERONAUTICAL ENGINEERING A SPECIAL BIBLIOGRAPHY WITH INDEXES, SUPPLEMENT 19, JUNE 1972.
Jun 72, 132p NASA-SP-7037 (19)

Descriptors: *Aerodynamics, *Aeronautical engineering, *Bibliographies, Aeronautics, Aircraft design, Aircraft engines, Ground support equipment.

For abstract, see STAR 10 21.

N72-29994 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EFFECT OF CONFIGURATION MODIFICATION ON THE HYPERSONIC AERODYNAMIC CHARACTERISTICS OF A BLENDED DELTA WING-BODY ENTRY VEHICLE.
J. P. Arrington, and G. C. Ashby, Jr. Sep 72, 58p
NASA-TM-X-2611, L-8419

Descriptors: *Aerodynamic characteristics, *Delta wings, *Hypersonic speed, *Wind tunnel stability tests, Aerodynamic configurations, Angle of attack, Center of pressure.

For abstract, see STAR 10 21.

N72-30004 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
FLIGHT MEASUREMENTS OF BUFFET CHARACTERISTICS OF THE F-104 AIRPLANE FOR SELECTED WING-FLAP DEFLECTIONS.
E. L. Friend, and W. J. Sefic. Aug 72, 48p
NASA-TN-D-6943, H-666

Descriptors: *Aerodynamic characteristics, *Buffeting, *F-104 aircraft, *Subsonic speed, *Transonic speed, Aircraft performance, Leading edge slats, Trailing-edge flaps.

For abstract, see STAR 10 21.

N72-30008 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
WIND-TUNNEL INVESTIGATION AT LOW SPEEDS OF A MODEL OF THE KESTREL (XV-6A) VECTORED-TRUST V/STOL AIRPLANE.
R. J. Margason, R. D. Vogler, and M. M. Winston. Jul 72, 177p NASA-TN-D-6826, L-8193

Descriptors: *Aerodynamic characteristics, *P-1127 aircraft, *Wind tunnel stability tests, Aerodynamic configurations, Ground effect, Wind tunnel models.

For abstract, see STAR 10 21.

N72-30264 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
NUMERICAL STUDY OF THE INFLUENCE OF THE WING TIP SHAPE ON THE VORTEX SHEET ROLLING UP.
Aug 72, 6p
NASA-TT-F-14538
Tran- Transl. Into English From Rech. Aerosp. (Chatillion-sous-bayneaux), 1971-1975 P 367-368

Descriptors:

For abstract, see STAR 10 21.

1B. Aeronautics

AD-750 388 PC$3.00/MF$0.95
Army Air Mobility Research and Development Lab Moffett Field Calif
NEAR OPTIMAL TAKEOFF PERFORMANCE OF A HEAVILY LOADED HELICOPTER IN GROUND EFFECT,
C. Rande Vause, and Fredric H. Schmitz. 1972, 15p

Descriptors: (*Helicopters, *Take-off), Performance (Engineering), Loading (Mechanics), Ground effect, Mathematical models, Army aircraft.
Identifiers: *Heavily loaded helicopters.

The purpose of the investigation was to quantitatively define, through mathematical modeling, those parameters which are important to the pilot who must perform a heavily loaded STOL takeoff. The mathematical model can be used to quantitatively predict takeoff performance of single rotor Army helicopters. The resulting equations are physically easy to interpret and offer new insight into the delicate power balance of the takeoff maneuver. (Author)

AD-750 493 PC$16.75/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
PILOT'S AND NAVIGATOR'S HANDBOOK FOR CIVIL AVIATION (SELECTED ARTICLES).
G. V. Markov, and L. A. Ostrogskii. 21 Jul 72, 295p Rept no. FTD-MT-24-291-72
Edited machine trans. of mono. Spravochnik Pilota i Shturmana Grazhdanskoi Aviatsii, Moscow, 1971 p84-225, 240-248, by Charles T. Ostertag, Jr., and Robert A. Potts.

Descriptors: (*Navigation, *Handbooks), (*Civil aviation, Navigation), Pilots, Radar navigation, Flight paths, Navigational aids, Celestial navigation, USSR.
Identifiers: Translations, Air navigation.

The handbook is based both on US and Soviet systems and includes instructions and operating procedures relative to the following: air navigation, international air routes, compass error, course systems, great circle navigation, various navigation instruments, Doppler radar system, azimuth and range system. Foreign (non-Soviet) electronic short-range navigation systems VOR, TACAN, VORTAC, DME, VRM-5 and consol systems, long-range navigation systems (CYTAC, DECCA, DECTRA), airborne KURS-MP-1 navigation and landing equipment, BSU-ZP airborne control system, the NL-10m navigation slide rule, and the NRK-2 navigation calculator are discussed. General information and trouble shooting instructions are given for the RBP-4, RPSN-2, GROZA, and ROZ-1 radar sets. Various methods of celestial navigation are discussed briefly. (Author)

AD-750 615 PC$3.00/MF$0.95
Princeton Univ N J
THE PRINCETON PENNSYLVANIA ARMY AVIONICS RESEARCH PROGRAM. TAKE OFF OF HEAVILY LOADED HELICOPTERS.
Final task rept. 1 Sep 66-30 Dec 71,
G. J. Born, E. J. Durbin, and F. H. Schmitz. Jan 72, 92p ECOM-02412-7
Contract DA-28-043-AMC-02412 (E)
See also AD-747 732.

Descriptors: (*Helicopters, Take-off), Hovering, Ground effect, Mathematical models, Flight paths, Optimization, Airspeed, Acceleration.
Identifiers: Control theory, Computerized simulation, *Heavily loaded helicopters.

In the report are given the results of the optimal control theory applied to the take-off of heavily loaded helicopters and the instrumentation requirements to enhance VTOL-STOL pilot flight control during the take-off maneuvers. The analysis and computation determined constrained and uncontrained extremal trajectories which maximize final altitude at a given distance (Research and Development Technical Report, ECOM 02412-4, August, 1969). The constrained optimal leads to a slightly decreased performance, but this is more than offset by the ease of implementation. The proposed take-off technique was simulated on an analog computer. A parameter sensitivity study was made which resulted in the formulation of specific instrumentation requirements. (Author)

AD-750 618 PC$3.00/MF$0.95
Princeton Univ N J
THE PRINCETON PENNSYLVANIA ARMY AVIONICS RESEARCH PROGRAM. ELEMENTS OF HELICOPTER HOVERING AND NEAR HOVER OPERATIONS WITH A SLING LOAD.
Final task rept. 1 Sep 66-30 Dec 71,
Theodor A. Dukes. Sep 72, 71p ECOM-02412-12
Contract DA-28-043-AMC-02412 (E)

Descriptors: (*Helicopters, Hovering), (*Cargo, Helicopters), Ground effect, Feedback, Damping, Equations of motion, Pitch (Motion), Mathematical models, Control systems.
Identifiers: Feedback control, Computerized simulation.

Three aspects of hovering and near-hover maneuvering of helicopters with sling loads are investigated. An elementary helicopter-load model is developed for the case of large attitude rate damping and is used to identify the most significant parameters and their effects on the dynamics. Various feedback loop closures are explored for their usefulness to provide damping to the pendulous helicopter-load motion. Three simple maneuvers are analyzed: arresting a swinging load motion, acceleration-deceleration and changing the hover location. Ideal thrust angle inputs are determined with which these elementary tasks can be performed so that there is no relative helicopter-load swinging motion at the end of the maneuver. A new Hover Mode of the earlier developed Integrated Trajectory Error Display (ITED) is described. (Author)

AD-750 936 PC$3.00/MF$0.95
Ohio State Univ Research Foundation Columbus
AIR-CUSHION PRESSURE DURING STIFF--OPERATION FOR AIR-CUSHION LANDING SYSTEMS. PART II. EXPERIMENTS.
Technical rept. for Jul 71-Jan 72,
Lit S. Han. Mar 72, 103p AFFDL-TR-71-4-Pt-2
Contracts F33615-70-C-1019, F33615-69-C-1001
See also report dated May 71, AD-726 606.

Descriptors: (*Ground effect machines, *Landings), Ground effect, Bags (Containers), Pneumatic devices, Flow fields, Orifices, Metal plates, Pressure, Mathematical models.
Identifiers: ACLS (Air Cushion Landing Systems), Air cushion landing systems.

The report describes the experimental verification of the theory developed in Part I for ACLS in its stiff-mode operation. It also reports the discharge coefficient data required for computing air flow requirements. At low ground clearances, the theory was verified to be in excellent agreement with the experimental data obtained. At higher values of the ground clearance where the viscous flow theory is not expected to hold, appreciable difference between the experimental data and theoretical computation was observed. A multi-jet theory yet to be developed is expected to bridge the gap. (Author)

AD-751 001 PC$3.00/MF$0.95
Pavement Safety Corp Skokie Ill
RUNWAY FRICTION DATA FOR 10 CIVIL AIRPORTS AS MEASURED WITH A MU-METER AND DIAGONAL BRAKED VEHICLE.
Final rept. Nov 71-Jul 72,
Peter J. Nussbaum, W. A. Hiering, and C. Grisel. Jul 72, 290p Rept no. PSC-107 FAA-RD-72-61
Contract DOT-FA72WA-2744

Descriptors: (*Runways, Friction), (*Aircraft landings, Braking), Pavements, Surface properties, Test equipment, Test methods.
Identifiers: Mu meters, Diagonal brake vehicles.

Runway friction measurements were made on ten civil airports representative of large and medium hub airports. Wet and dry surface data were obtained with a Mu-Meter and FAA Diagonal Braked Vehicle. Specialized supplementary equipment used and techniques and procedures developed to conduct the tests are described. Raw and

processed data for each airport are tabulated in separate appendixes. Included are runway and airport traffic statistics and photographs of the pavements tested. (Author)

N72-27992 PC$3.00
National Aeronautics and Space Administration, Washington, D.C.
AERONAUTICAL ENGINEERING A SPECIAL BIBLIOGRAPHY WITH INDEXES, SUPPLEMENT 18, MAY 1972.
May 72, 113p NASA-SP-7037 (18)

Descriptors: *Aerodynamics, *Aeronautical engineering, *Bibliographies, Aeronautics, Aircraft design, Aircraft engines, Ground support equipment.

For abstract, see STAR 10 19.

N72-27993 PC$9.00
National Aeronautics and Space Administration, Washington, D.C.
A CUMULATIVE INDEX TO THE 1971 ISSUES OF AERONAUTICAL ENGINEERING.
A Special Bibliography, Jan. 1972
Jan 72, 779p NASA-SP-7037 (14)

Descriptors: *Aerodynamics, *Aeronautical engineering, *Bibliographies, Aeronautics, Aircraft design, Aircraft engines, Ground support equipment.

For abstract, see STAR 10 19.

N72-28006 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AIRCRAFT TIRE BEHAVIOR DURING HIGH-SPEED OPERATIONS IN SOIL.
T. J. Leland, and E. G. Smith. Aug 72, 62p
NASA-TN-D-6813, L-7641

Descriptors: *Accident prevention, *Aircraft tires, *Friction factor, *Performance tests, *Soils, Equipment specifications, Flight safety, Friction measurement, Loads (forces).

For abstract, see STAR 10 19.

N72-28011 PC$3.00/MF$0.95
Techtran Corp., Glen Burnie, Md.
FLIGHT PECULIARITIES OF AIRCRAFT IN THE ATMOSPHERES OF PLANETS.
G. M. Moskalenko. Aug 72, 16p
NASA-TT-F-14344, PR-84
Contract NASW-2037
Tran- Transl. Into English of O Nekotorykh Osobennostyakh Poleta Letatelnykh App. V Atmosfere Planet Rept. Pr-84 Inst. for Space Res., Acad. Sci. USSR, Moscow, 1971 22 P

Descriptors: *Aerodynamic characteristics, *Aircraft performance, *Earth atmosphere, *Reentry physics, Aerodynamic coefficients, Atmospheric entry, Spacecraft performance, Trajectory analysis.

For abstract, see STAR 10 19.

N72-28015 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
EFFECT OF STABILIZATION ON VTOL AIRCRAFT IN HOVERING FLIGHT.
R. K. Greif, E. B. Fry, R. M. Gerdes, and T. D. Gossett. Aug 72, 24p NASA-TN-D-6900, A-4015
Subm- Prepared in Cooperation With Army Air Mobility Res. and Develop. Lab., Moffett Field, Calif.

Descriptors: *Aircraft performance, *Aircraft stability, *Vertical takeoff aircraft, Aerodynamic characteristics, Attitude control, Hovering stability.

For abstract, see STAR 10 19.

N72-29004 PC$10.25/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Aeroelastic and Structures Research Lab.
EXAMINATION OF THE COLLISION FORCE METHOD FOR ANALYZING THE RESPONSES OF SIMPLE CONTAINMENT/DEFLECTION STRUCTURES TO IMPACT BY ONE ENGINE ROTOR BLADE FRAGMENT.
R. M. Zirin, and E. A. Witmer. May 72, 163p
NASA-CR-120952, ASRL-TR-154-6
Contract NGR-22-009-339

Descriptors: *Aircraft safety, *Rotor blades (turbomachinery), *Turbojet engines, Elastic properties, Impact damage, Plastic properties, Stress analysis.

For abstract, see STAR 10 20.

N72-29999 PC$4.00/MF$0.95
Clemson Univ., S.C.
EVALUATION OF MINIMUM VARIANCE ESTIMATORS FOR SIGNAL DERIVATIVES IN REAL NOISE ENVIRONMENTS.
R. W. Snelsire. 1972, 37p NASA-CR-112146
Contract NGR-41-001-024

Descriptors: *Aircraft landing, *All-weather air navigation, *Flight instruments, Aircraft safety, Airline operations, Display devices.

For abstract, see STAR 10 21.

N72-30001 PC$5.25/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
AN ANALYSIS OF THE TAKEOFF AND LANDING PERFORMANCE OF A JET-POWERED STOL AUGMENTOR WING DESIGN.
S. E. Post, B. J. Gambucci, and C. A. Holzhauser. Aug 72, 63p NASA-TM-X-62176

Descriptors: *Aerodynamic characteristics, *Aerodynamic configurations, *Short takeoff aircraft, Aerodynamic noise, Noise reduction, Performance tests.

For abstract, see STAR 10 21.

N72-30981 PC$11.00/MF$0.95
Office National Detudes Et de Recherches Aerospatiales, Paris (France).
AEROSPACE ACTIVITIES.
Annual Report, 1971
1972, 177P

Descriptors: *Aeronautical engineering, *France, *Research and development, *Research facilities, Aerodynamics, Aircraft structures, Materials, Systems engineering, Wind tunnels.

For abstract, see STAR 10 21.

PB-212 484 PC$3.00/MF$0.95
National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.
AIRCRAFT ACCIDENT REPORT. TANDY CORPORATION GATES LEARJET MODEL 25, N658TC, NEAR THE VICTORIA COUNTY, FOSTER AIRPORT, VICTORIA, TEXAS, 18 JANUARY 1972.
9 Aug 72, 15p File-3-0003, NTSB-AAR-72-24

Descriptors: (*Aviation accidents, *Accident investigations), General aviation aircraft, Passenger aircraft, Instrument landing, Approach, Visibility.
Identifiers: Learjet 25 aircraft.

A Gates Learjet Model 25, N658TC, operated by the Tandy Corporation of Fort Worth, Texas, crashed at approximately 0745 central standard time, on January 18, 1972, during a nonprecision instrument approach to the Victoria County-Foster Airport, Victoria, Texas. The two crewmembers and seven passengers received fatal injuries. The airplane was destroyed. The airplane was enroute from Fort Worth, Texas, on an IFR clearance to Victoria, Texas. Witnesses in the area of the crash reported heavy fog and visibility restricted to approximately 100 feet. One nautical mile visibility is required for this airplane to be authorized for a landing at the Victoria County-Foster Airport. The National Transportation Safety Board determines that the probable cause of this accident was the lack of altitude awareness on the part of the flightcrew while descending into known weather conditions which were conducive to a rapid deterioration in forward visibility. (Author)

PB-212 495 PC$3.00/MF$0.95
Intermetrics, Inc., Cambridge, Mass.
PWI (PILOT WARNING INDICATORS) TEST AND DEVELOPMENTAL RESOURCE UTILIZATION.
Final rept. Apr-Nov 71,
Neal A. Carlson, Peter A. Grundy, H. Raymond Morth, Edward M. Copps, and James H. Flanders. Nov 71, 220p DOT-TSC-188-1
Contract DOT-TSC-188
See also PB-212 496.

Descriptors: (*Aviation safety, Collision avoidance), (*Collision avoidance, Warning systems), Aircraft collisions, Air traffic control, Computerized simulation, Mathematical models, Effectiveness, Infrared equipment, Optical equipment.
Identifiers: PWI (Pilot Warning Indicators), *Pilot warning indicators.

The report documents the analysis performed for the DOT Transportation Systems Center in support of its test and evaluation program for optical-infrared Pilot Warning Indicator (PWI) systems. The TSC PWI program is designed to determine the significant performance characteristics of candidate optical-IR PWI devices, to identify performance deficiencies and feasible design improvements, and ultimately to predict the operational effectiveness of these devices in the air traffic environment. The objective of the analysis reported is to assess the utility of existing test facilities and evaluation tools currently available to the PWI program at TSC. The effective implementation and coordination of these resources is of primary concern. A secondary objective is to identify the need for modifications or additions to the existing test facilities and evaluation tools, and to determine the feasibility of such extensions. (Author)

PB-212 496 PC$3.00/MF$0.95
Intermetrics, Inc., Cambridge, Mass.
PWI (PILOT WARNING INDICATORS) SYSTEMS SURVEY.
Final rept. Apr-Nov 71,
James H. Flanders, Peter A. Grundy, and Neal A. Carlson. Nov 71, 151p DOT-TSC-188-2
Contract DOT-TSC-188
See also PB-212 495.

Descriptors: (*Aviation safety, Collision avoidance), (*Collision avoidance, Warning systems), Aircraft collisions, Air Traffic control, Computerized simulation, Bibliographies.
Identifiers: PWI (Pilot Warning Indicators), *Pilot warning indicators.

The survey report presents a compilation, classification, and review of 176 documents related to PWI and CAS research and development. The selection of documents emphasizes those published from 1968 to the present, although earlier significant documents are included. Subject categories include: CAS System References; PWI System References; Proceedings and Literature Searches; Facilities and Programs; and Atmospheric Physics. A multi-dimensional classification code for CAS and PWI systems is

developed and applied to candidate systems revealed during the survey. Written reviews of documents vary from a few lines to 2 or 3 pages, and are grouped according to subject. (Author)

1C. Aircraft

AD-750 318 PC$3.00/MF$0.95
Frankford Arsenal Philadelphia Pa
DYNAMIC RESPONSE INDEX MINIMIZATION FOR PERSONNEL ESCAPE SYSTEMS,
Leonard A. DeStefano. 1972, 14p

Descriptors: (*Escape systems (Aerospace), *Human engineering), Wounds + injuries, Probability, Aircraft equipment, Catapults.

The paper outlined a technique which may be employed with minimum modification to existing rocket catapult components to reduce the probability of injury to users of aircraft emergency escape systems. Experimental tests have verified the results of theoretical analyses and have demonstrated the ability to modify the catapult ballistics and thus moderate the dynamic response indes (DRI). In addition, this technique may also be employed to upgrade the performance of existing and future aircraft escape systems by permitting maximization of the ejection velocity with respect to the allowable catapult stroke and DRI specification limit. (Author)

AD-750 359 PC$3.00/MF$0.95
Army Air Mobility Research and Development Lab Moffett Field Calif Ames Directorate
A THEORETICAL AND EXPERIMENTAL INVESTIGATION OF FLAP-LAG STABILITY OF HINGELESS HELICOPTER ROTOR BLADES,
Robert A. Ormiston, and William C. Bousman. 1972, 14p

Descriptors: (*Rotor blades (Rotary wings), Stability), Helicopter rotors, Deflection, Equations of motion, Oscillation, Damping, Numerical analysis.
Identifiers: Hingeless rotor blades, Elastic coupling.

A substantial insight into the fundamental stability characteristics of the hingeless rotor may be obtained by considering only the flap and lead-lag degrees of freedom of a single blade. Although portions of this problem have been examined in previous research, the effects of may basic rotor parameters are poorly understood. The present study was undertaken to provide a rigorous formulation of the problem, and to systematically investigate the important parameters which characterize actual hingeless rotor blade configurations. In the absence of available experimental data a model rotor was designed and tested to validate the theoretical analysis. (Author)

AD-750 387 PC$3.00/MF$0.95
Army Air Mobility Research and Development Lab Fort Eustis Va Eustis Directorate
DYNAMIC COMPATIBILITY OF HELICOPTER PROPULSION SYSTEMS,
John M. Vance, and James Gomez, Jr. 1972, 15p

Descriptors: (*Helicopter engines, Vibration), Design, Airframes, Stability, Dynamics.

The overall problem of achieving dynamic compatibility in helicopter propulsion system can be conveniently divided into four major areas: engine vibration limits; design of the engine/airframe interface; whirling and vibration of power transmission shafting, gearboxes, and bearings; and torsional stability of the engine and drive train with closed-loop fuel controls. These four areas are discussed each with a review of the state of the art and recommendations for future research and development. (Author)

AD-750 441 Reprint
Northwestern Univ Evanston Ill
BRITTLE FRACTURE UNDER DYNAMIC LOADING CONDITIONS.
1972, 20p
Contract N00014-67-A-0356-0014
Availability: Pub. in the Contributions to the Theory of Aircraft Structures, Delft, 1972 p379-397.

Descriptors: (*Airframes, Fracture (Mechanics)), Brittleness, Cracks, Crack propagation, Loading (Mechanics), Shear stresses, Deformation, Numerical analysis.
Identifiers: *Brittle fracture, Dynamic loads.

The extension of a flaw at the diffraction of elastic stress waves is examined by employing the balance of rates of energies as a fracture criterion. It is shown that the balance of rates of energies can be expressed in terms of expressions for the field variables in the plane of fracture and in the immediate vicinity of the tip of the crack. Due to a dynamic overshoot effect, which depends on the rate of change of the stress at the wavefront and therefore on the rate of application of the loads the magnitudes of critical loads decrease when the loads are applied more rapidly. (Author)

AD-750 501 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
SELF-ADJUSTING AUTOMATIC CONTROL SYSTEMS OF AEROELASTIC AIRCRAFT,
F. I. Fedorenko, V. A. Vishnevetskaya, V. I. Glukhov, and L. R. Lvov. 17 Aug 72, 16p Rept no. FTD-MT-24-353-72
Edited machine trans. of Informatsionnye Materialy (USSR) n7 p36-42 1970, by Rene E. Courville.

Descriptors: (*Flight control systems, Design), Aeroelasticity, Vibration, Damping, Automatic pilots, Stabilization systems, Transfer functions, USSR.
Identifiers: Translations, *Automatic control systems.

High quality control of an aircraft as a rigid body can be achieved (with allowance for the nonlinearity and inertia of the actuator) by using appropriate compensating devices and by placing adaptive filters in the angular velocity sensor circuits to eliminate noise caused by high and low frequency elastic oscillations. The primary low frequency components flexural vibrations in the wings and fuselage can be damped by special control surfaces on the wings and fuselage. This damping should not be altered from accelerometer sensors positioned in selected points. Required phase relationships are obtained with compensating necessary and either phase lead or phase lag filters. Automatic control of optimal gain in the stabilization loops is accomplished with the aid of spectrum analyzers. The synthesis of controller structure and parameters should be based on graph theory methods. (Author)

AD-750 502 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
PROSPECTIVE AUTOMATIC FLIGHT CONTROL SYSTEMS,
A. D. Aleksandrov. 18 Aug 72, 20p Rept no. FTD-MT-24-354-72
Edited machine trans. of Informatsionnye Materialy (USSR) n7 p20-29 1970, by Robert D. Hill.

Descriptors: (*Flight control systems, Design), Adaptive control systems, Automatic pilots, Feedback, Logic circuits, Stabilization systems, Algorithms, USSR.
Identifiers: Translations, Feedback control, *Automatic control systems.

The report contains a describion of nonlinear self adjusting and variable structure automatic control systems for piloted and pilotless flight vehicles. Control problems considered include load stabilization, limitation of critical regimes, and control of variable pitch and roll angles. Emphasis is placed on the extension of stability ranges by appropriate switching of the controller structure. The aditional use of adaptive loops is demonstrated and oscillations arising from intrinsic nonlinear characteristics of electric servo systems (dead zones and time lags) are examined. (Author)

AD-750 515 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
BOUNDARY LAYER CONTROL AS A MEANS OF IMPROVING AIRCRAFT MANEUVERABILITY,
G. P. Dianov, and N. A. Yatskov. 7 Sep 69, 9p
Rept no. FTD-HC-23-0835-72
Unedited rough draft trans. of Teplo- i Massoperenos (USSR) n12 p435-439 1969,

Descriptors: (*Aerial rudders, *Boundary layer control), (*Aircraft, Maneuverability), Ascent trajectories, Descent, Jet flaps, Lift, Trailing edge, Response, USSR.
Identifiers: Translations.

As a result of investigations a conclusion is made that for the lift control of an aircraft with the control of boundary layer, an auxiliary rudder of small relative chord, mounted along the trailing edge of wing or flap, can be used. Blowing of the flat air jet can be realized on the flap or directly unto the auxiliary rudder. The results of experimental investigation of the effectiveness of the auxiliary rudder, mounted on a flap, are presented. (Author)

AD-750 542 PC$3.00/MF$0.95
Winzen Research Inc Minneapolis Minn
DESIGN AND FABRICATION OF A BALLOON FOR POWDERED FLIGHT IN THE MINIMUM WIND FIELD.
Final rept. 19 Apr-31 Aug 72,
Jean R. Nelson, and Peter J. Osborne. 12 Oct 72, 7p AFCRL-72-0487
Contract F19628-72-C-0318

Descriptors: (*Balloons, Design), Structural parts, Configuration, Tolerances (Mechanics), Statistical data, Specifications.

The project was concerned with the design and fabrication of a balloon capable of carrying a 3500 lb. payload at an altitude of 60,000 feet to demonstrate the feasibility of powering a free balloon near the minimum wind field. For this purpose five balloons were fabricated based on a design in accordance with the specifications of Section F of The Schedule. The balloon, which has a diameter of 118.66 feet and a gore length of 174.87 feet, has a double-wall construction consisting of 83 integrally sealed gores of 1.5 mil film material. In order to provide a smoother surface to the air flow, the bottom half of the balloon was tailored to a natural shape in place of the usual tapered tangent construction. (Author)

AD-750 584 PC$3.00/MF$0.95
Army Natick Labs Mass
TRAJECTORY ANALYSIS OF A RADIAL HOMING GLIDING PARACHUTE IN A UNIFORM WIND.
Technical rept.,
Arthur L. Murphy, Jr. Sep 71, 35p Rept no. USA-NLABS-TR-73-2-AD

Descriptors: (*Parawings, Descent trajectories), (*Air drop operations, Parawings), Deceleration, Parachute descents, Steering, Lift, Wind, Impact prediction, Nonpowered flight.
Identifiers: *Gliding parachutes, Radial homing, Radial guidance.

The two dimensional trajectory of a radial homing gliding parachute in a uniform wind is presented. The kinematics of the motion is discussed generating two first order differential equations which are separated and solved by direct integration. The resulting expression functionally relates the radial

position of the parachute to the instantaneous value of the azimuth angle. Using this result, an exact solution for time in terms of space coordinates is obtained. (Author)

AD-750 585 PC$3.00/MF$0.95
Army Natick Labs Mass
A DISCUSSION OF THE APPLICABILITY OF PARACHUTES WITH PULLED DOWN VENTS FOR AIRDROP OF SUPPLIES AND EQUIPMENT FROM A 500 FOOT ALTITUDE.
Final rept.,
Edward J. Giebutowski. Oct 71, 25p Rept no. USA-NLABS-TR-72-23-AD

Descriptors: (*Parachutes, *Descent trajectories), (*Air drop operations, Parachutes), Configuration, Parachute descents, Oscillation, Velocity, Vents, Drop testing.
Identifiers: G-11A parachutes.

Data from thirty one airdrop tests were plotted to show the variation of vertical, horizontal and total velocities and system orientation angle fro the vertical as a function of altitude loss from the launch altitude. The purpose was to determine the applicability of using standard G-11A parachutes modified with pulled down vents for airdrop of Army supplies and equipment from an altitude of 500 feet. It was concluded that the 'system second vertical' was the earliest event which could be considered a suitable criterion for acceptable impact conditions of horizontal and vertical velocity and system orientation angle. (Author)

AD-750 633 PC$3.00/MF$0.95
Boeing Co Philadelphia Pa Vertol Div
SECTIONALIZED MAIN ROTOR BLADE ADVANCED DESIGN STUDY.
Final technical rept.,
Tadeusz Tarczynski. Aug 72, 122p Rept no. D210-10293-1 USAAMRDL-TR-72-8
Contract DAAJ02-70-C-0072

Descriptors: (*Rotor blades (Rotary wings), Design), Helicopter rotors, Bolted joints, Composite materials, Stresses, Maintenance, Logistics, Cost effectiveness.
Identifiers: H-1 aircraft, UH-1 aircraft, Design criteria.

The report covers a study undertaken for the advanced design of a sectionalized main rotor blade. After investigation of the whole spectrum of design arrangements, a bolted-toegether design (with field replaceable boxes, L.E. tip and trailing edge) was chosen. For direct replacement of existing blades, a bolted design was selected with essentially the same dynamic rotor characteristics of the current production blade. The parameters that were closely matched to achieve this were: natural frequency, loads, and dynamic balance axis. A cost increase of approximately 50 percent is indicated over present UH-1H rotor blades to match current design features, utilizing ground rules on inherent and external damage specified by the procuring agency. (Author)

AD-750 634 PC$3.00/MF$0.95
Rochester Applied Science Associates Inc N Y
INVESTIGATION OF THE DISSIPATION OF THE TIP VORTEX OF A ROTOR BLADE BY MASS INJECTION.
Final rept.,
Richard P. White, Jr., and John C. Balcerak. Aug 72, 96p Rept no. RASA-72-03 USAAMRDL-TR-72-43
Contract DAAJ02-71-C-0036

Descriptors: (*Rotor blades (Rotary wings), Vortices), Aerodynamic slots, Spoilers, Angle of attack, Flow fields, Injection, Flow visualization, Wind tunnel models.
Identifiers: *Rotor tip vortices, H-1 aircraft, UH-1D aircraft.

The report describes an experimental research program in which the outer section of a UH-1D helicopter blade was modified to incorporate a system for injecting the tip vortex produced by the blade with a mass of linearly directed air. The effects of nozzle geometry, the velocity of injection, the turbulence wavelength, and the angle of injection on the resulting strength of the trailed tip vortex were investigated, and the results are presented in terms of quantitative measurements of the circulation strength as a function of the injected mass of air. (Author)

AD-750 738 PC$3.00/MF$0.95
Advisory Group for Aerospace Research and Development Paris (France)
A RELATION BETWEEN MEASURED C.G. VERTICAL ACCELERATIONS AND THE LOADS AT THE T-TAIL OF A MILITARY AIRPLANE,
Otto Buxbaum. Sep 72, 20p Rept no. AGARD-597 NATO furnished.

Descriptors: (*Tails (Aircraft), Fatigue (Mechanics)), Strain gages, Aerodynamic loading, Bending, Center of gravity, Stresses, Strain (Mechanics), Correlation techniques, Acceleration.

An engineering solution is presented for correlating two different random loads - time histories, based on measurements of C.G. vertical accelerations and loads at the tailplane of an aircraft. The choice of instrumentation for a fleet airplane is described and the measurements of operational loads are related to C. G. acceleration countings. (Author)

AD-750 745 PC$3.00/MF$0.95
Cornell Aeronautical Lab Inc Buffalo N Y
CAPABILITY OF THE TOTAL IN-FLIGHT SIMULATOR (TIFS).
Final rept.,
Philip A. Reynolds, Richard Wasserman, Gardner J. Fabian, and Paul R. Motyka. Feb 72, 162p Rept no. CAL-TB-3020-F-4 AFFDL-TR-72-39
Contract F33615-71-C-1110

Descriptors: (*Flight simulators, Design), Transport planes, Turbulence, Flight control systems, Cockpits.
Identifiers: TIFS (Total In Flight Simulators), Total in flight simulators, C-131 aircraft, Six degrees of freedom.

TIFS is a newly developed, variable stability C-131 aircraft with the unique capability to vary its flying qualities in all six degrees of freedom. It also surpasses the utility of past variable stability aircraft through the realism possible in its separate, new evaluation cockpit. The capabilities and features of this in-flight simulator considerably broaden the ability of the aircraft designer to deal with difficult trade-offs in flying qualities problems. A base configuration can be set up and then its stability and control characteristics can be systematically varied for investigations to gain research knowledge pertinent to flight vehicle and flight control system design. The report describes the theoretical basis for in-flight motion reproduction and how this theory can be applied to determine the TIFS capability to simulate a given aircraft. Physical characteristics as determined in flight and examples of simulation are given. Flight test records of model-following performance are also included. The objective of the report is to give the reader the basic information for planning a TIFS experiment. (Author)

AD-750 950 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
REDUCTION OF BASE DRAG DURING SUPERSONIC VELOCITIES USING POWER METHOD,
B. I. Buryshev. 7 Sep 72, 8p Rept no. FTD-HC-23-0836-72
Unedited rough draft trans. Teplo- i Massoperenos (USSR) n12 p35-38 1969.

Descriptors: (*Supersonic planes, Drag), Reduction, Injection, Blunt bodies, Trailing edge, Boundary layer, Model tests, Nacelles, USSR.
Identifiers: *Base drag reduction, Translations.

The article describes the results of experimental drag investigation of a nacelle containing two engines and a wing of a long range supersonic plane for M = 2.4.

AD-750 951 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
BALANCING HIGH-SPEED LIGHT ROTORS RESTING ON BEARINGS WITH GAS LUBRICATION,
A. N. Bragin, and E. A. Panfilov. 17 Aug 72, 16p Rept no. FTD-MT-24-290-72
Edited machine trans. of mono. Teoriya i Praktika Uravnoveshivaniya Mashin i Priborov (Theory and Practice of Balancing of Machines and Instruments) Moscow, 1970 p210-216, by Rene E. Courville.

Descriptors: (*Rotor blades (Rotary wings), Stabilization), (*Gas bearings, Vibration), Oscillation, Journal bearings, Stability, Material removal, Center of gravity, Machine shop practice, USSR.
Identifiers: Balancing, Translations.

Under the influence of disbalance due to compression of the gassy layer in the bearing, the center of gravity of the rotor describes a circle, the radius of which exceeds its eccentricity in proportion to the angular velocity of rotation, i.e., the geometrical center of the journal also describes a circle of constantly greater radius, increasing the compression of the gas layers. At a certain increase of the inflexibility of the gas layer, so called inversion takes place: a transition accompanied by a sharp increase in the oscillation amplitude of the journal, after which the rotor begins to rotate about the center of gravity with smaller oscillations, which are close to the value of residual eccentricity. (Author)

N72-27995 PC$6.75/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
WIND TUNNEL INVESTIGATION OF AERODYNAMIC CHARACTERISTICS OF SCALE MODELS OF THREE RECTANGULAR SHAPED CARGO CONTAINERS.
G. H. Laub, and H. M. Kodani. Jul 72, 93p NASA-TM-X-62169
Subm- Sponsored in Part By Aamrdl

Descriptors: *Aerodynamic characteristics, *External stores, *Helicopters, *Wind tunnel models, Aerodynamic configurations, Containers, Data acquisition.

For abstract, see STAR 10 19.

N72-27999 PC$8.75/MF$0.95
Rochester Applied Science Associates, Inc., N.Y.
BLADE FREQUENCY PROGRAM FOR NONUNIFORM HELICOPTER ROTORS, WITH AUTOMATED FREQUENCY SEARCH.
Informal Final Report
S. G. Sadler. 1972, 135p NASA-CR-112071, RASA-72-01
Contract NAS1-11216

Descriptors: *Helicopters, *Rotary wings, *Stress analysis, *Structural analysis, Computer programs, Elastic properties, Vibration effects.

For abstract, see STAR 10 19.

N72-28000 PC$3.50/MF$0.95
Techtran Corp., Glen Burnie, Md.

DYNAMIC TESTING OF HELICOPTER COMPONENTS.
H. Schumacher. May 72, 29p NASA-TT-F-14282
Contract NASW-2037
Tran- Transl. Into English From Helicopter Fatigue Testing, Proc. of the Dglr Symp. on Helicopters and Propellers Stuttgart, Dglr, Dec. 1970 P 97-123

Descriptors: *Aircraft equipment, *Helicopter design, *Performance tests, *Structural design, Aircraft parts, Equipment specifications, Materials tests.

For abstract, see STAR 10 19.

N72-28001 PC$3.25/MF$0.95
Techtran Corp., Glen Burnie, Md.
STRUCTURAL STABILITY CONSIDERATIONS IN THE ROTOR SYSTEM OF THE HOT GAS JET HELICOPTER DO132.
L. Brenner. Jun 72, 23p NASA-TT-F-14281
Contract NASW-2037
Tran- Transl. Into English From Helicopter Fatigue Testing, Proc. of the Dglr Symp. on Helicopters and Propellers Stuttgart, Dglr, Dec. 1970 P 77-96, 177

Descriptors: *Helicopters, *Rotary wings, *Stress analysis, *Structural analysis, Engineering drawings, Vibration effects, Vibration tests.

For abstract, see STAR 10 19.

N72-28002 PC$7.00/MF$0.95
Hughes Tool Co., Culver City, Calif. Aircraft Div.
A PERFORMANCE APPLICATION STUDY OF A JET-FLAP HELICOPTER ROTOR.
R. J. Sullivan, S. Laforge, and B. W. Holchin. May 72, 96p NASA-CR-112030
Contract NAS1-10365

Descriptors: *Helicopters, *High speed, *Jet flaps, *Rotor lift, Lift, Maneuverability, Mechanical drives, Rotor speed.

For abstract, see STAR 10 19.

N72-28003 PC$5.50/MF$0.95
Lockheed-georgia Co., Marietta. Advanced Transport Technology.
STUDY OF THE APPLICATION OF ADVANCED TECHNOLOGIES TO LONG-RANGE TRANSPORT AIRCRAFT. VOLUME 2 RESEARCH AND DEVELOPMENT REQUIREMENTS.
Final Technical Report
R. H. Lange, R. F. Sturgeon, W. E. Adams, E. S. Bradley, and J. F. Cahill. 1972, 70p
NASA-CR-112089
Contract NAS1-10701

Descriptors: *Aerodynamic configurations, *Aircraft design, *Subsonic speed, *Supercritical wings, *Transport aircraft, Composite materials, Materials tests, Research and development, Technology utilization.

For abstract, see STAR 10 19.

N72-28004 PC$4.00/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Brunswick (West Germany). Inst. Fuer Flugmechanik.
ON A PYROTECHNIC-BALLISTICAL DEPLOYMENT AID FOR PARACHUTES.
R. Oliva. 1972, 40p DLR-MITT-72-07
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Explosive devices, *Parachutes, *Pyrotechnics, Equipment specifications, Product development, Reliability engineering.

For abstract, see STAR 10 19.

N72-28007 PC$5.00/MF$0.95
Boeing Co., Seattle, Wash. Commercial Airplane Group.
DESIGN INTEGRATION AND NOISE STUDIES FOR JET STOL AIRCRAFT. VOLUME 1 PROGRAM SUMMARY.
Final Report
V. O. Okeefe, and G. S. Kelley. May 72, 56p
NASA-CR-114471, D6-40552-1-VOL-1
Contract NAS2-6344
Misc- Original Contains Color Illustrations

Descriptors: *Aircraft design, *Aircraft noise, *Jet aircraft, *Short takeoff aircraft, Aerodynamic characteristics, Noise reduction, Transport aircraft, Wing flaps.

For abstract, see STAR 10 19.

N72-28008 PC$4.25/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
IN A MODERN PLANE.
V. S. Frolov. Jul 72, 43p NASA-TT-F-14351
Contract NASW-2035
Tran- Transl. Into English of the Book V Sovremennom Samolete Moscow, Znaniye Press, 1971

Descriptors: *Flight safety, *Jet aircraft, *Pilot performance, *Psychomotor performance, Accident prevention, Human factors engineering, Safety factors.

For abstract, see STAR 10 19.

N72-28017 PC$11.00/MF$0.95
Boeing Co., Renton, Wash. Commercial Airplane Div.
PREDICTED FLIGHT CHARACTERISTICS OF THE AUGMENTOR WING JET STOL RESEARCH AIRCRAFT.
R. E. Spitzer. Jul 72, 180p NASA-CR-114463, D6-40381
Contract NAS2-6025

Descriptors: *Aerodynamic configurations, *De havilland aircraft, *Short takeoff aircraft, Aircraft performance, Aircraft stability, Performance tests.

For abstract, see STAR 10 19.

N72-28018 PC$8.75/MF$0.95
Washington Univ., St. Louis, Mo. Dept. of Mechanical and Aerospace Engineering.
CONCEPTS FOR A THEORETICAL AND EXPERIMENTAL STUDY OF LIFTING ROTOR RANDOM LOADS AND VIBRATIONS. PHASE 6-A EFFECTS OF BLADE TORSION, OF BLADE FLAP BENDING FLEXIBILITY AND OF ROTOR SUPPORT FLEXIBILITY ON ROTOR STABILITY AND RANDOM RESPONSE.
K. H. Hohenemser, and S. K. Yin. Jun 72, 134p
NASA-CR-114480
Contract NAS2-4151

Descriptors: *Flexible wings, *Rotary wings, *Structural analysis, *Vibration effects, Aerodynamic characteristics, Stability derivatives, Stress analysis.

For abstract, see STAR 10 19.

N72-28020 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SIMULATION STUDY OF THE LIFT ROLL COUPLING PROBLEM FOR HOVERING VTOL AIRCRAFT.
R. A. Jacobsen, and R. K. Greif. Aug 72, 18p
NASA-TN-D-6906, A-3172

Descriptors: *Flight simulators, *Hovering, *Lift, *Roll, *Vertical takeoff aircraft, Aerodynamic characteristics, Aircraft control, Lateral control.

For abstract, see STAR 10 19.

N72-28027 PC$3.00/MF$0.95
North Carolina State Univ., Raleigh.
A FAST ACTING ELECTRICAL SERVO FOR THE ACTUATION OF FULL SPAN, FOWLER--TYPE WING FLAPS IN DLC APPLICATIONS A DETAIL DESIGN STUDY.
F. O. Smetana, R. J. Montoya, and R. K. Carden. Jul 72, 88p NASA-CR-2059
Contract NGR-34-002-086

Descriptors: *Actuators, *Electromechanical devices, *Wing flaps, Feedback control, Lift devices, Logic circuits, Servomotors, Systems engineering.

For abstract, see STAR 10 19.

N72-28028 PC$24.35/MF$0.95
Airesearch Mfg. Co., Los Angeles, Calif.
STUDY OF AIRCRAFT ELECTRICAL POWER SYSTEMS.
Final Technical Report
Jun 72, 487p NASA-CR-120939, AIR-72-8414
Contract NAS3-14367

Descriptors: *Aircraft equipment, *Electric power supplies, *Research projects, *Systems analysis, *Transport aircraft, Electric equipment, Equipment specifications, Product development, Systems engineering.

For abstract, see STAR 10 19.

N72-28746 PC$3.50/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Stuttgart (West Germany). Inst. Fuer Plasmadynamik.
INVESTIGATION OF A LOW POWER PLASMA ACCELERATOR.
L. Liebing, and F. Seidel. 1972, 30p
DLR-FB-72-31
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Plasma accelerators, *Satellite attitude control, *Systems engineering, Heat flux, Low currents, Plasma jets.

For abstract, see STAR 10 19.

N72-28786 PC$4.00/MF$0.95
Pratt and Whitney Aircraft, East Hartford, Conn.
STUDIES FOR DETERMINING THE OPTIMUM PROPULSION SYSTEM CHARACTERISTICS FOR USE IN A LONG RANGE TRANSPORT AIRCRAFT.
G. L. Brines. Jul 72, 39p NASA-CR-120950, PWA-4449
Contract NAS3-15550

Descriptors: *Noise reduction, *Transport aircraft, *Turbofan aircraft, *Two stage turbines, Aerodynamic characteristics, Exhaust gases.

For abstract, see STAR 10 19.

N72-28890 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPUTER PROGRAM FOR INVESTIGATING EFFECTS OF NONLINEAR SUSPENSION--SYSTEM ELASTIC PROPERTIES ON PARACHUTE INFLATION LOADS AND MOTIONS.
L. R. Poole. Aug 72, 46p NASA-TM-X-2592, L-8390

Descriptors: *Aerodynamic characteristics, *Aerodynamic forces, *Parachute descent, Computer programs, Elastic properties, Numerical analysis, Runge-kutta method.

For abstract, see STAR 10 19.

N72-28983 PC$3.00/MF$0.95
Aeronautical Research Labs., Melbourne (Australia).
THE INTERPRETATION OF THE SCATTER FACTOR.
Feb 72, 17p ARL/SM-NOTE-373

Descriptors: *Aircraft equipment, *Airframes, *Reliability engineering, *Safety factors, *Service life, Numerical analysis, Quality control, Statistical analysis, Systems analysis.

For abstract, see STAR 10 19.

N72-28988 PC$10.75/MF$0.95
Laboratorium Fur Betriebsfestigkeit, Darmstadt (West Germany).
OPTIMIZATION OF THE BOLTED JOINT WING LOWER SURFACE-WING BODY FITTING OF A MILITARY AIRCRAFT . OPTIMIERUNG DER VERSCHRAUBTEN FUEGUNG ZWISCHEN FLUEGELUNTERDECKE UND 1C, 51CG EINES MILITAERFLUGZEUGES.
D. Schuetz, and O. Goekgoel. 1971, 172p TB-95
Subm- Prepared Jointly With Hamburger Flugzeugbau

Descriptors: *Body-wing configurations, *Bolts, *Fatigue tests, Aluminum, Creep rupture strength, Fittings, Military aircraft, Titanium.

For abstract, see STAR 10 19.

N72-29006 PC$3.00/MF$0.95
Techtran Corp., Glen Burnie, Md.
INFLUENCE OF THE FLEXIBILITY OF THE ROTOR ELEMENTS ON THE DYNAMIC DEFLECTION OF THE ROTOR AS A WHOLE.
N. G. Samarov. Aug 72, 13p NASA-TT-F-14390
Contract NASW-2037
Tran- Transl. Into English From Izv. Vyssh. Ucheb. Zaved., Aviats. Tekh. (Kazan), V. 14, No. 2, 1971 P 67-75

Descriptors: *Dynamic response, *Eccentricity, *Rotors, Deflection, Elastic deformation, Euler-lagrange equation, Vibration damping.

For abstract, see STAR 10 20.

N72-29009 PC$5.50/MF$0.95
United Aircraft Corp., Stratford, Conn.
APPLICATION OF BORON/EPOXY REINFORCED ALUMINUM STRINGERS AND BORON/EPOXY SKID GEAR FOR THE CH54B HELICOPTER TAIL CONE. PHASE 2 FABRICATION, INSPECTION AND FLIGHT TEST.
Final Report, May 1971 - Mar. 1972
R. T. Welge. 28 Aug 72, 68p NASA-CR-112101
Contract NAS1-10459
Subm- Sponsored in Part By Army

Descriptors: *Boron compounds, *Ch-54 helicopter, *Composite materials, *Epoxy resins, *Helicopter design, Airframes, Flight tests, Production engineering, Quality control, Reliability engineering.

For abstract, see STAR 10 20.

N72-29564 PC$7.00/MF$0.95
General Electric Co., Cincinnati, Ohio.
RENE 95 BRAZED JOINT METALLURGICAL PROGRAM.
Final Report
C. Gay, J. Givens, S. Mastrorroco, and A. Sterman. 1972, 97p NASA-CR-120957, TM-72-326
Contract NAS2-6056

Descriptors: *Lift fans, *Stress analysis, *Udimet alloys, Cracking (fracturing), Failure analysis, Fracture mechanics, Heat resistant alloys, Metallurgy, Optimization, Tensile tests.

For abstract, see STAR 10 20.

N72-29992 PC$3.50/MF$0.95
Aeronautical Research Committee, Bangalore (India).
CONICALLY CAMBERED TRIANGULAR WINGS OPTIMISED FOR LEAST DRAG WITHOUT LEADING EDGE SUCTION.
V. S. Holla, T. N. Krishnaswamy, and S. M. Ramachandra. Oct 71, 30p ARC-TR-2

Descriptors: *Aerodynamic characteristics, *Cambered wings, *Conical camber, *Delta wings, *Leading edges, Aerodynamic configurations, Aerodynamic loads, Optimization.

For abstract, see STAR 10 21.

N72-30002 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
ANALYSIS OF AN ELECTROHYDRAULIC AIRCRAFT CONTROL SURFACE SERVO AND COMPARISON WITH TEST RESULTS.
J. W. Edwards. Aug 72, 73p NASA-TN-D-6928, H-629

Descriptors: *Aerodynamic configurations, *Aircraft control, *Control surfaces, *Flight control, Hydraulic equipment, Linear systems, Nonlinear systems, Systems analysis.

For abstract, see STAR 10 21.

N72-30003 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A THEORETICAL AND EXPERIMENTAL INVESTIGATION OF FLAP-LAG STABILITY OF HINGELESS HELICOPTER ROTOR BLADES.
R. A. Ormiston, and W. G. Bousman. Aug 72, 28p NASA-TM-X-62179
Subm- Sponsored in Part By Army Air Mobility R and D Lab.

Descriptors: *Hovering, *Nonstabilized oscillation, *Rotor blades, *Structural vibration, Aerodynamic drag, Elastic damping, Flaps (control surfaces), Trailing-edge flaps.

For abstract, see STAR 10 21.

N72-30007 PC$3.00/MF$0.95
New York Univ., N.Y.
EXPERIMENTAL VERIFICATION OF LOW SONIC BOOM CONFIGURATION.
A. Ferri, H. Wang, and H. Sorensen. Jun 72, 111p NASA-CR-2070, NYU-AA-71-19
Contract NGL-33-016-119

Descriptors: *Aerodynamic configurations, *Aircraft design, *Sonic booms, *Supersonic flight, Numerical analysis, Shock waves, Wind tunnel models.

For abstract, see STAR 10 21.

N72-30009 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AN ANALYTICAL STUDY OF AIRPLANE-AUTOPILOT RESPONSE TO ATMOSPHERIC TURBULENCE.
W. I. Ochman. Sep 72, 43p NASA-TN-D-6869, L-8140

Descriptors: *Automatic flight control, *Automatic pilots, *Feedback control, *Systems engineering, *Transport aircraft, Aircraft equipment, Atmospheric turbulence, Equipment specifications.

For abstract, see STAR 10 21.

N72-30010 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EFFECTS OF AN IN-FLIGHT THRUST REVERSER ON THE STABILITY AND CONTROL CHARACTERISTICS OF A SINGLE-ENGINE FIGHTER AIRPLANE MODEL.
C. E. Mercer, and D. L. Baiden. Sep 72, 237p NASA-TN-D-6886, L-8395

Descriptors: *Fighter aircraft, *Scale models, *Thrust reversal, *Wind tunnel stability tests, Aerodynamic characteristics, Aircraft performance, Aircraft stability.

For abstract, see STAR 10 21.

N72-30013 PC$11.75/MF$0.95
Bell Helicopter Co., Fort Worth, Tex.
LARGE SCALE WIND TUNNEL INVESTIGATION OF A FOLDING TILT ROTOR.
Final Report
May 72, 195p NASA-CR-114464, D272-099-002
Contract NAS2-5461

Descriptors: *Aerodynamic characteristics, *Folding structures, *Helicopters, *Rotary wings, Aerodynamic configurations, Data acquisition, Wind tunnel stability tests.

For abstract, see STAR 10 21.

N72-30015 PC$3.75/MF$0.95
British Aircraft Corp., Weybridge (England). Commercial Aircraft Div.
THE CORROSION PROPERTIES OF AIRFRAME CONTAMINANTS.
R. Kohler, and J. Scott. Dec 71, 35p D-MAT-179
Contract KS/1/0692/C.B.43 (A)2

Descriptors: *Airframes, *Contaminants, *Corrosion tests, *Microbiology, *Stress corrosion, Aircraft maintenance, Aluminum alloys, Bac aircraft, Corrosion resistance, Fluids.

For abstract, see STAR 10 21.

N72-30046 PC$6.25/MF$0.95
North American Rockwell Corp., Downey, Calif. Space Div.
LOW-COST FABRICATION AND DIRECT BOND INSTALLATION OF FLAT, SINGLE-CURVATURE AND COMPOUND-CURVATURE ABLATIVE HEAT SHIELD PANELS.
L. B. Norwood. Jun 72, 81p NASA-CR-112109, SD-72-SH-0086
Contract NAS1-10708

Descriptors: *Ablative materials, *Adhesive bonding, *Composite materials, *Heat shielding, Airframes, Dc 3 aircraft, Fabrication, Thermodynamic properties.

For abstract, see STAR 10 21.

1D. Aircraft Flight Control and Instrumentation

AD-750 786 PC$3.00/MF$0.95
Mitre Corp Mclean Va
ALTIMETRY DISPALY STUDY. PART 2. ANALYSIS OF ALTITUDE ACCIDENTS.
Final rept.,
Harold D. Hoekstra, Edwin B. Perry, and Shungchi Huang. May 72, 229p* FAA-RD-72-46-Pt-2
Contract DOT-FA70WA-2448
Prepared in cooperation with Flight Safety Foundation, Arlington, Va. See also Part 1, AD-750 829 and Part 3, AD-751 021.

Descriptors: (*Altimeters, *Display systems), (*Aviation accidents, Analysis), Reviews, Malfunctions.

The purpose of this part of the study was to determine the extent to which altimetry is involved as a causal factor in aircraft accidents and incidents.

Reviews were made of avaiation activities. In addition, accident records for available non-U. S. air carriers were included. These data were supplemented by world-wide comments in response to a survey conducted on the subject of altimetry. The scope of this effort included records encompassing over 300 million flying hours, over 41,000 accidents and 72,000 incidents. In addition, over 770 civil aviation malfunction reports involving altimetry and pitot static system discrepancies were included. (Author)

AD-750 829 PC$3.00/MF$0.95
Mitre Corp Mclean Va
ALTIMETRY DISPLAY STUDY. PART 1. SUMMARY REPORT.
Final rept.,
T. R. Mitchell. May 72, 24p* Rept no. MTR-6190
FAA-RD-72-46-Pt-1
Contract DOT-FA70WA-2448
See also Part 2, AD-750 786.

Descriptors: (*Altimeters, *Display systems), Human engineering, Aviation accidents, Reviews, Costs.

Within aviation today, several different altimeter displays are used; opinion as to their readability varies; and, some aircraft accidents have been attributed to altitude errors. In an effort to specifically assess this situation so that any required actions could be initiated, a four-part altimetry study was made, including: Part Two - An accident analysis by Flight Safety Foundation, to determine whether altimetry is a frequent causal factor; Part Three - A review of altimetry R and D by NAFEC, to establish the superiority of certain displays; and Part Four - A survey of the current display population and an estimation of improvement costs by MITRE, to determine the impact of a mandated change. Part One presents the overall altimetry study conclusions and recommendations as drawn from the results of the other three study parts taken together. (Author)

AD-750 854 PC$3.00/MF$0.95
Mitre Corp Mclean Va
ALTIMETRY DISPLAY STUDY. PART 4. SURVEY OF CURRENT DISPLAY FORMAT USAGE, AND ESTIMATION OF RETROFIT IMPROVEMENT COSTS.
Final rept.,
T. R. Mitchell. May 72, 39p* Rept no. MTR-6189
FAA-RD-72-46-Pt-4
Contract DOT-FA70WA-2448
See also Part 3, AD-751 021.

Descriptors: (*Altimeters, *Display systems), Configuration, Transport planes, Costs.
Identifiers: General aviation aircraft.

Contents:
Brief description of predominant altimeter types and display formats;
Survey results--Current display format usage;
Estimation of display format improvement costs.

AD-751 021 PC$3.00/MF$0.95
National Aviation Facilities Experimental Center Atlantic City N J
ALTIMETRY DISPLAY STUDY. PART 3. REVIEW OF R AND D ON DISPLAY READABILITY.
Final rept. Nov-Feb 71,
Jack J. Shrager. May 72, 79p* Rept no. FAA-NA-72-6 FAA-RD-72-46-Pt-3
Supersedes AD-743 094. See also Part 2, AD-750 786 , and Part 4, AD-750 854.

Descriptors: (*Altimeters, *Display systems), Human engineering, Reviews, Bibliographies.
Identifiers: Readability.

A review of all literature published since 1960 relating to aircraft height or altitude display was made. This review was supplemented by a series of conferences with experimentalists currently working in this field. The results of the literature review and series of conference are evaluated and summarized, and this si further supplemented by an annotated bibliography of the documents invluded in the literature review. (Author)

1E. Air Facilities

N72-30250 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
OPTIMUM RUNWAY ORIENTATION RELATIVE TO CROSSWINDS.
L. W. Falls, and S. C. Brown. Sep 72, 19p
NASA-TN-D-6930

Descriptors: *Aircraft landing, *Runway conditions, *Runways, *Wind effects, Alignment, Optimization, Orientation, Statistical analysis.

For abstract, see STAR 10 21.

2. AGRICULTURE

2B. Agricultural Economics

COM-72-70033 PC-GPO
Bureau of the Census, Washington, D.C.
CENSUS OF AGRICULTURE: 1969. VOLUME I: AREA REPORTS.
Final repts.
1972, 91 issues
Paper copy available from GPO $317.50/set of 91 reports as C3.31/4:969/v1.

The reports present state and county data from the 1969 Census of Agriculture. Section 1 presents state data on farms, land in farms, land use, size of farm, tenure and characteristics of farm operators, farm income and sales, farm production expenses, machinery and equipment, livestock and poultry, crops harvested and a summary of selected economic class, and large-scale farms by type. For class 1-5 farms, a more detailed set of tables is presented on all the above items plus a summary of farm characteristics by tenure of operator and type of organization, size of farm, economic class, type of farm, type of farm by economic class, and large-scale farms by type. Also included are county data on farm land, crops, machinery and equipment, livestock, and for miscellaneous commodities not listed in county reports. Data on farms, farm characteristics, and farm products for individual counties are presented in Section 2. For class 1-5 farms, additional information is shown on agricultural chemicals, irrigation, tree fruits and grapes, nursery and greenhouse products, and forest products, as well as more detailed information on the items shown for all farms. For prices of individual reports, see below:
Part 1: Maine. Jun 72, 450p, PC-GPO$3.50 as C3.31/4:969/v1/pt1/bk1.
Part 2: New Hampshire. Jun 72, 384p, PC-GPO$3.00 as C3.31/4:969/v1/pt2/bk1.
Part 4: Massachusetts. Jun 72, 410p, PC-GPO$3.00 as C3.31/4:969/v1/pt4/bk1.
Part 6: Connecticut. Jun 72, 370p, PC-GPO$2.75 as C3.31/4:969/v1/pt6/bk1.
Part 22: Delaware. Jun 72, 328p, PC-GPO$2.50 as C3.31/4:969/v1/pt22/bk1.
Part 24: Virginia. Section 1: Summary Data. Jun 72, 366p, PC-GPO$2.75 as C3.31/4:969/v1/pt24/bk1.
Part 24: Virginia. Section 2: County Data, Accomack Co. - King George Co. Jun 72, 400p, PC-GPO$3.00 as C3.31/4:969/v1/pt24/bk2.
Part 24: Virginia. Section 2: County Data, King William Co. - York Co. Jun 72, 399p, PC-GPO$3.00 as C3.31/4:969/v1/pt24/bk3.
Part 25: West Virginia. Section 1: Summary Data. Jun 72, 323p, PC-GPO$2.50 as C3.31/4:969/v1/pt25/bk1.
Part 25: West Virginia. Section 2: County Data. Jun 72, 448p, PC-GPO$3.50 as C3.31/4:969/v1/pt25/bk2.
Part 27: South Carolina. Jun 72, 748p, PC-GPO$5.50 as C3.31/4:969/v1/pt27/bk1.
Part 28: Georgia. Section 1: Summary Data. Jun 72, 402p, PC-GPO$3.00 as C3.31/4:969/v1/pt28/bk1.
Part 28: Georgia. Section 2: County Data, Appling Co. - Jasper Co. Jun 72, 648p, PC-GPO$4.75 as C3.31/4:969/v1/pt28/bk2.
Part 28: Georgia. Section 2: County Data, Jeff Davis Co. - Worth Co. Jun 72, 645p, PC-GPO $4.75 as C3.31/4:969/v1/pt28/bk3.
Part 29: Florida. Section 1: Summary Data. Jun 72, 425p, PC-GPO$3.25 as C3.31/4:969/v1/pt29/bk1.
Part 29: Florida. Section 2: County Data. Jun 72, 536p, PC-GPO$4.00 as C3.31/4:969/v1/pt29/bk2.
Part 37: Texas. Section 1: Summary Data. Jun 72, 425p, PC-GPO$3.25 as C3.31/4:969/v1/pt37/bk1.
Part 37: Texas. Section 2: County Data, Anderson Co. - Galveston Co. Jun 72, 688p, PC-GPO$5.00 as C3.31/4:969/v1/pt37/bk2.
Part 37: Texas. Section 2: County Data, Garza Co. - Montague Co. Jun 72, 687p, PC-GPO$5.00 as C3.31/4:969/v1/pt37/bk3.
Part 37: Texas. Section 2: County Data, Montgomery Co. - Zavala Co. Jun 72, 689p, PC-GPO$5.00 as C3.31/4:969/v1/pt37/bk4.
Part 50: Hawaii. Jun 72, 290p, PC-GPO$2.25 as C3.31/4:969/v1/pt50/bk1.

N72-28329 PC$12.25/MF$0.95
California Univ., Berkeley. Forestry Remote Sensing Lab.
ANALYSIS OF REMOTE SENSING DATA FOR EVALUATING VEGETATION RESOURCES.
Annual Progress Report
30 Sep 71, 204p NASA-CR-127443
NASA ORDER W-13308, NASA ORDER W-13300
Subm- Prepared in Cooperation With Forest Service, Washington, D. C.

Descriptors: *Agriculture, *Photointerpretation, *Remote sensors, *Spectrum analysis, *Vegetation, Data systems, Earth resources, Ground support equipment, Portable equipment.

For abstract, see STAR 10 19.

2C. Agricultural Engineering

PB-212 585 PC$3.00/MF$0.95
New Mexico Agricultural Experiment Station, University Park.
SOIL ASSOCIATIONS AND LAND CLASSIFICATION FOR IRRIGATION, SIERRA COUNTY.
Research rept.,
H. J. Maker, J. M. Dowas, and J. U. Anderson.
Sep 72, 58p RR-233 W73-00267, OWRR-B-015-NMEX (20)

Descriptors: (*Soil properties, Irrigated land), (*Irrigated land, *New Mexico), Soil classification, Soil surveys, Maps, Agriculture, Statistical data.
Identifiers: *Sierra County (New Mexico).

Information is presented on the suitability of soils in Sierre County, New Mexico for irrigation. The acreage, general location, and relative capability of the soils for use in irrigated agriculture are given. The general soil map provided the information necessary for the classification for irrigation. The data was organized and presented on the basis of soil associations shown on the general soil map and on the irrigation land classification map. Sierra County has about 2,700,200 acres, of which about 23 percent were considered suitable for irrigation. (Author)

2D. Agronomy and Horticulture

COM-72-11338 Reprint
National Weather Service, Clemson, S.C.
A PREDICTION TECHNIQUE FOR SNAP BEAN MATURITY INCORPORATING SOIL MOISTURE WITH THE HEAT UNIT SYSTEM,
A. J. Kish, W. L. Ogle, and C. B. Loadholt. 21 May 71, 9p NOAA-72082119
Prepared in cooperation with South Carolina Agricultural Experiment Station, Clemson, and South Carolina Medical Univ., Charleston.
Pub. in Agricultural Meteorology, v10 p203-209 1971.

Descriptors: (*Bean plants, Plant growth), (*Plant growth, Predictions), Soil water, Temperature, Heat budget.

Field experiments were conducted at Clemson University in 1966 to study the accuracy of the heat unit system in predicting maturity dates of snap beans. Because this system was found unreliable, it was decided to integrate the soil moisture parameter into the degree hour method. The formula that gave the smallest coefficient of variation was one using the daily heat unit multiplied by a ratio of the daily available soil moisture to a constant soil moisture value. The optimum available soil moisture level suggested as the constant soil moisture value in the formula was in the 57-59% range. (Author)

N72-28330 PC$14.50/MF$0.95
Helsinki Univ. of Technology, Otaniemi (Finland).
EFFECT OF WEATHER ON WATER ECONOMY AND CROP YIELDS.
J. Hooli. 1971, 247p
LANG- IN FINNISH ENGLISH SUMMARY

Descriptors: *Farm crops, *Precipitation (meteorology), *Soils, Crop vigor, Earth resources, Finland, Irrigation.

For abstract, see STAR 10 19.

2E. Animal Husbandry

AD-750 378 PC$3.00/MF$0.95
Army Medical Research Inst of Infectious Diseases Frederick Md
CONTROL OF VEE EPIZOOTIC-EPIDEMIC BY VACCINE DEVELOPED AT USAMRIID,
Richard O. Spertzel, and Dan Crozier. 1972, 15p

Descriptors: (*Venezuelan equine encephalomyelitis virus, *Vaccines), Veterinary medicine, Humans, Virus diseases, Epidemiology, Immunology, Infectious diseases, Control, Arboviruses, Disease vectors, Culicidae.

Venezuelan equine encephalomyelitis (VEE) is a zoonotic arbovirus disease affecting both Equidae and man. Infection in equine animals may be subclinical, but more often it assumes one of the following clinical forms: (a) mild illness consisting primarily of anorexia, fever, and depression; (b) severe illness characterized by anorexia, high fever, stupor, staggering, and blindness, followed by recovery with or without permanent sequellae; or (c) fatal disease with a similar sequence of signs, but terminating in death. Overall mortality rate in equines probably exceeds 75% of those infected. In man, VEE commonly occurs as an influenza-like illness characterized by generalized muscular pains, severe frontal headache and high fever; overt signs of encephalitis are rare, occurring primarily in children. Overall mortality in humans probably is no more than 1%. As part of the effort to control these epidemics a live attenuated virus vaccine (TC-83) developed at the U. S. Army Medical Research Institute of Infectious Diseases (USAMRIID) was administered to horses, burros, and mules. The TC-83 vaccine was originally developed for protection of laboratory personnel working in high-risk areas and subsequently has been administered to more than 6,000 human beings. During developmental studies, evidence suggested that the vaccine might be suitable for use in Equidae.

AD-750 822 Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
AN EPIZOOTIC OF AUJESZKY'S DISEASE IN SWINE IN TAIWAN: VIRUS ISOLATION, IDENTIFICATION, AND SEROEPIDEMIOLOGICAL STUDIES.
Technical rept.,
James P. S. Yang, Philip T. Durfee, Ching-H sien Ma, Chieh-Pao Chang, and Albert E. New. 15 Apr 72, 11p Rept no. NAMRU-2-TR-512
Availability: Pub. in Chinese Jnl. of Microbiology, v5 n1,2 p69-75 Jun 72.

Descriptors: (*Herpetic viruses, *Swine), (*Virus diseases, Swine), Epidemiology, Serodiagnosis, Identification, Etiology, Infectious diseases, Veterinary medicine, Taiwan.
Identifiers: *Aujeszkys disease, *Pseudorabies.

An epizootic of Aujeszky's Disease occurred in a large swine herd in southern Taiwan from June through November 1971. Pseudorabies virus (PrV) was isolated from the brain of baby pigs suspected of having died of Aujeszky's Disease. The isolated virus produced typical herpes CPE in HEp-2, chick embryo, secondary hamster embryo, and MK-2 tissue culture cells, was specifically neutralized by antipseudorabies serum, and also gave a positive reaction to the indirect fluorescent antibody test. Representative convalescent sera from sows and young pigs that survived the epizootic showed that 87% of the sows' sera and 94% of the young pigs' sera neutralized the isolated virus as well as the Aujeszky strain of PrV. The data show that an epizootic of pseudorabies occurred in this swine herd during 1971. (Author)

AD-750 824 Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
A CATALOGUE OF THE ZOONOSES OF TAIWAN.
Technical rept.,
Philip T. Durfee, and John H. Cross. 8 Apr 72, 20p Rept no. NAMRU-2-TR-513
Availability: Pub. in Jnl. of the Formosan Medical Association, v71 n8 p509-524, 28 Aug 72.

Descriptors: (*Infectious diseases, Animals), (*Disease vectors, Infectious diseases), Public health, Humans, Veterinary medicine, Diseases, Bacteria, Rickettsia, Protozoa, Worms, Virus diseases, Distribution, Taiwan, Reviews.
Identifiers: *Animal diseases.

This review of the literature on zoonotic diseases was prepared as a ready reference for physicians, veterinarians, and public health workers in Taiwan. The catalogue has been limited to those infectious zoonotic diseases which are of some public health importance. Any infectious disease of man which has an animal reservoir or any infectious disease of animals which has been reported in man on Taiwan has been listed. Diseases have been listed under four major headings: (1) Bacterial Diseases, (2) Viral and Rickettsial Diseases, (3) Protozoan Diseases, (4) Helminthic Diseases. Excluded from this report are diseases of mycotic origin.

AD-750 891 PC$3.00/MF$0.95
School of Aerospace Medicine Brooks AFB Tex
SELECTED TOPICS IN LABORATORY ANIMAL MEDICINE. VOLUME VIII. PARASITOLOGY.
Aeromedical Review,
George W. Irving, III. Sep 72, 50p Rept nos. SAM-TR-72-13, SAM-Review-2-72
See also Volume 15, AD-750 892.

Descriptors: (*Parasites, *Laboratory animals), (*Veterinary medicine, Laboratory animals), Insects, Protozoa, Arachnids, Trematodes, Nematodes, Worms.
Identifiers: Host parasite relations.

The major parasites of laboratory animals are divided into eight groups: Insects, arachnids, pentastomes, acanthocephalids, unicellular parasites (protozoan), cestodes, trematodes, and nematodes. A broad review is presented of the major characteristics that delineate each of the eight groups of laboratory animal parasites, and examples are cited of some of the more common parasites in each group. A host-parasite list for several species of laboratory animals is included. (Author)

AD-750 892 PC$3.00/MF$0.95
School of Aerospace Medicine Brooks AFB Tex
SELECTED TOPICS IN LABORATORY ANIMAL MEDICINE. VOLUME XV. SELECTING PRIMATES FOR USE IN BIOMEDICAL RESEARCH.
Aeromedical Review,
Gale D. Taylor. Oct 72, 35p Rept no. SAM-Review-4-72
See also Volume 8, AD-750 891 and Volume 18, AD-750 893.

Descriptors: (*Primates, Medical research), (*Veterinary medicine, Laboratory animals), Selection, Classification, Distribution.
Identifiers: Taxonomy.

Contents:
Geographic range of the living primates;
Classification of the living primates;
A review of the primate families;
Guidelines for primate species selection.

AD-750 893 PC$3.00/MF$0.95
School of Aerospace Medicine Brooks AFB Tex
SELECTED TOPICS IN LABORATORY ANIMAL MEDICINE. VOLUME XVIII. THE SQUIRREL MONKEY.
Aeromedical Review,
James L. Kupper, and William E. Britz. Sep 72, 22p Rept nos. SAM-Review-5-72, SAM-TR-72-20
See also Volume 15, AD-750 892.

Descriptors: (*Monkeys, Medical research), (*Veterinary medicine, Laboratory animals), Diseases, Primates.
Identifiers: Squirrel monkeys.

A summary of the husbandry, diseases, and uses of the squirrel monkey in biomedical research is presented. The fifty-seven references provide source information for this species of laboratory animal. (Author)

COM-72-11351 PC$3.00/MF$0.95
Washington State Dept. of Fisheries, Olympia.
DETERMINATION OF THE NUTRITIVE VALUE OF NORTH PACIFIC FISH MEALS FOR POULTRY.
Completion rept. Feb 67-Feb 69,
Lawrence R. Berg. Apr 69, 26p NOAA-72091983
Grant NMFS-1-41-R
Prepared in cooperation with Washington State Univ., Puyallup.

Descriptors: (*Fish protein concentrates, Nutritive value), (*Chickens, Animal nutrition), Growth, Toxicity, Herrings.
Identifiers: Hake, Anchovies.

The determination of the nutritive value of North Pacific fish meals for poultry was initiated to make comparison of hake and other fish meals, using British Columbia (B-C.) herring meal as a base control. Knowledge gained from poultry feeding studies will provide a guide for use in diets for salmonids. A suitable substitute for herring meal for salmonid diets is essential to enable fish cultural expansion and its economic production. The ex-

perimental data on poultry and early work with salmonids indicates a direct substitute of B. C. herring meal with other meals reduces overall effectiveness of the diets. (Author)

2F. Forestry

N72-28321 PC$4.75/MF$0.95
Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.
THE DEVELOPMENT OF SPECTRO-SIGNATURE INDICATORS OF ROOT DISEASE IMPACTS ON FOREST STANDS.
Annual Progress Report
F. P. Weber, and J. F. Wear. 30 Sep 70, 55p
NASA-CR-127450
NASA ORDER W12996

Descriptors: *Biophysics, *Fungi, *Physiological responses, *Plant roots, *Trees (plants), Data processing, Earth resources, Infectious diseases, Multispectral band scanners, Remote sensors.

For abstract, see STAR 10 19.

N72-28324 PC$11.00/MF$0.95
Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.
MONITORING FOREST LAND FROM HIGH ALTITUDE AND FROM SPACE.
Annual Progress Report
30 Sep 71, 180p NASA-CR-127702
NASA ORDER W-13308
Subm- Prepared in Cooperation With Calif. Univ.

Descriptors: *Forests, *Remote sensors, Aerial photography, Calibrating, Classifications, Earth resources technology satellites, Infestation, Photointerpretation, Timber vigor.

For abstract, see STAR 10 19.

N72-28325 PC$4.25/MF$0.95
Minnesota Univ., Minneapolis. School of Forestry.
REMOTE SENSING OF VIGOR LOSS IN CONIFERS DUE TO DWARF MISTLETOE.
Annual Progress Report
M. P. Meyer, D. W. French, R. P. Latham, C. A. Nelson, and R. W. Douglass. 30 Sep 71, 45p
NASA-CR-127682
NASA ORDER R-09-038-002
Subm- Prepared for Calif. Univ., Berkeley. Forestry Remote Sensing Lab. in Cooperation With Dept. of Agr. Forest Serv.

Descriptors: *Conifers, *Infestation, *Remote sensors, Aerial photography, Earth resources, Optical filters, Photographic film.

For abstract, see STAR 10 19.

N72-29407 PC$16.25/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
FOURTH ANNUAL EARTH RESOURCES PROGRAM REVIEW. VOLUME 5 AGRICULTURE AND FORESTRY PROGRAMS.
21 Jan 72, 281p NASA-TM-X-68562,
MSC-05937-VOL-5
Conf- Rev. Held At Houston, Tex., 17-21 Jan. 1972

Descriptors: *Agriculture, *Conferences, *Forests, *Remote sensors, Blight, Corn, Earth resources program, Infestation, Multispectral band scanners.

For abstract, see STAR 10 20.

PB-212 726 PC$3.00/MF$0.95
Agency for International Development, Washington, D.C. Office of Science and Technology.
FORESTRY IN DEVELOPING COUNTRIES. POTENTIALS, CONSTRAINTS, AND OPPORTUNITIES,
Gordon D. Fox. Oct 72, 76p TA/OST-72-12

Descriptors: (*Forestry, *Developing countries), Forest trees, Economic development, Wood products, Structural timber, Reforestation, Utilization, Transportation, Research, Management.

With about one-half of the world's forest area located in the developing countries, adequate forest programs to manage and exploit this renewable natural resource are an important aspect in economic development. This preliminary analysis focuses on the following issues: principal factors inhibiting better management of forest resources; technical aspects of these inhibiting factors; practical steps that might overcome these problems; and likely impact on timber resources and utilization if such steps were taken.

3. ASTRONOMY AND ASTROPHYSICS

3A. Astronomy

N72-28856 PC$5.50/MF$0.95
European Southern Observatory, Hamburg (West Germany).
EUROPEAN SOUTHERN OBSERVATORY RESEARCH ACTIVITIES, TELESCOPES, AND AUXILIARY EQUIPMENT.
Annual Report, 1970
1970, 67P

Descriptors: *Astronomical observatories, *Chile, Astronomical telescopes, Galaxies, Management.

For abstract, see STAR 10 19.

N72-29465 PC$7.00/MF$0.95
American Science and Engineering, Inc., Cambridge, Mass.
RESEARCH STUDY ON STELLAR X-RAY IMAGING EXPERIMENT, VOLUME 1.
Final Report, 12 Jun. 1969 - 31 Mar. 1972
H. H. Wilson, and L. P. Vanspeybroeck. 15 May 72, 100p NASA-CR-123743, ASE-2978-VOL-1
Contract NAS8-24385

Descriptors: *Imaging techniques, *Light amplifiers, *Microchannels, *X ray astronomy, Equipment specifications, Image intensifiers, Vidicons.

For abstract, see STAR 10 20.

N72-29466 PC$8.75/MF$0.95
American Science and Engineering, Inc., Cambridge, Mass.
RESEARCH STUDY ON STELLAR X-RAY IMAGING EXPERIMENT, VOLUME 2.
Final Report, 12 Jun. 1969 - 31 Mar. 1972
H. H. Wilson, and L. P. Vanspeybroeck. 15 May 72, 131p NASA-CR-127688, ASE-2978-VOL-2
Contract NAS8-24385

Descriptors: *Imaging techniques, *Optical equipment, *Spaceborne astronomy, *Test equipment, *Test facilities, *X ray astronomy, Equipment specifications, Management planning, Product development, Telescopes.

For abstract, see STAR 10 20.

N72-29826 PC$3.25/MF$0.95
New Hampshire Univ., Durham.
ORIENTATION SYSTEM FOR GAMMA RAY ASTRONOMY EXPERIMENTS.
A. J. Mammy. 4 Feb 72, 22p NASA-CR-127800
Contract NGL-30-002-021

Descriptors: *Cosmic rays, *Gamma rays, *Instrument orientation, *Performance tests, *Radiation detectors, *X ray astronomy, Flight tests, Gondolas, Polarization (waves).

For abstract, see STAR 10 20.

N72-29974 PC$4.00/MF$0.95
Royal Observatory, Edinburgh (Scotland).
THE ROYAL OBSERVATORY EDINBURGH 1822 - 1972.
1972, 39p

Descriptors: *Astronomical observatories, *Histories, Astronomical telescopes, Great britain.

For abstract, see STAR 10 20.

N72-30256 PC$5.50/MF$0.95
European Southern Observatory, Hamburg (West Germany).
RESEARCH ACTIVITIES.
Annual Report 1970
1972, 68P

Descriptors: *Astronomical observatories, *Astronomical telescopes, *Southern hemisphere, Costs, International cooperation, Personnel, Schmidt cameras.

For abstract, see STAR 10 21.

N72-30819 PC$6.00/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
LUNAR EPHEMERIS AND SELENOGRAPHIC COORDINATES OF THE EARTH AND SUN FOR 1979 AND 1980.
A. D. Hartung. 1972, 442p NASA-SP-3061

Descriptors: *Astronomical coordinates, *Ephemerides, Computer programming, Graphs (charts), Tables (data).

For abstract, see STAR 10 21.

N72-30820 PC$6.00/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
LUNAR EPHEMERIS AND SELENOGRAPHIC COORDINATES OF THE EARTH AND SUN FOR 1977 AND 1978.
A. D. Hartung. 1972, 442p NASA-SP-3060

Descriptors: *Astronomical coordinates, *Ephemerides, Graphs (charts), Moon, Tables (data).

For abstract, see STAR 10 21.

N72-30828 PC$6.00/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
LUNAR EPHEMERIS AND SELENOGRAPHIC COORDINATES OF THE EARTH AND SUN FOR 1981 AND 1982.
A. D. Hartung. 1972, 441p NASA-SP-3062

Descriptors: *Astronomical catalogs, *Celestial mechanics, *Ephemerides, *Lunar phases, Astronomical coordinates, Celestial reference systems, Computer programs.

For abstract, see STAR 10 21.

N72-30838 PC$9.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MOON VIEW PERIOD TABULATIONS (WITH STATION MASKING) FOR MANNED SPACE FLIGHT NETWORK STATIONS, BOOK 1.
Technical Report, 1 Jan. - 1 Jul. 1973
M. M. Gattie, and R. L. Williams. Nov 70, 144p
NASA-TM-X-68837

Descriptors: *Manned space flight network, *Moon, *Tables (data), Observation.

For abstract, see STAR 10 21.

3B. Astrophysics

AD-750 798 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
VERTICAL VELOCITIES AND HORIZONTAL WAVE PROPAGATION IN THE SOLAR PHOTOSPHERE,
Steven Musman, and David M. Rust. 3 Mar 70, 31p Rept no. AFCRL-72-0510
Availability: Pub. in Solar Physics, v13 p261-286 1970.

Descriptors: (*Solar atmosphere, Magnetic fields), Atmospheric motion, Line spectrum.
Identifiers: *Photosphere, Solar granulation, Velocity fields, *Solar magnetic fields.

The authors used the Sacramento Peak Doppler-Zeeman Analyzer to study the velocity and magnetic fields in 60 min x 300 min areas on the solar disk. The authors mapped the steady component of the line-of-sight velocity and longitudinal magnetic fields and compared them with the coarse Ca+ network. The collective phase behavior of the 5-min oscillations is studied in detail. (Author)

AD-750 799 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
INTERPRETATION OF INFRARED OXYGEN SPECTROHELIOGRAMS,
Richard C. Altrock. 13 Dec 68, 9p Rept no. AFCRL-72-0514
Availability: Pub. in Solar Physics, v7 p343-350 1969.

Descriptors: (*Solar spectrum, *Oxygen), Atomic spectroscopy, Spectra (Infrared), Magnetic fields, Sunspots, Chromosphere.
Identifiers: *Spectroheliographs, Oxygen atoms, Solar magnetic fields.

Spectroheliograms have been obtained in the line cores of two infrared multiplets of neutral oxygen. Those made in the lines of the 7770 A multiplet show a very smooth intensity distribution, with faculae and sunspot penumbrae at a very low contrast with respect to the undisturbed photosphere. Spectroheliograms made in the core 8446.37 A show evidence of coupling with chromospheric features and of blending with a line of neutral iron. An analysis of a 7772 A spectroheliogram indicates that a magnetic field of approximately 1500 G is required to produce the 'disappearing penumbra' phenomenon. (Author)

AD-750 800 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
SUPERGRANULES AND THE HYDROGEN CONVECTION ZONE,
G. W. Simon, and N. W. Weiss. 1 Nov 68, 17p Rept no. AC AFCRL-72-0511
Availability: Pub. in Zeitschrift fuer Astrophysik, v69 p435-450 1968.

Descriptors: (*Solar atmosphere, Convection (Heat transfer)), Atmospheric motion, Mathematical models.
Identifiers: Photosphere, Solar granulation.

Solar granules and supergranules are characterized by two different length scales. Orthodox mixing length theory cannot account for the preferred diameter of 30,000 km observed in supergranules. However, convective heat transport can be more efficient if the motion exteads over several scale heights. The physics of convection in a polytropic atmosphere is discussed and the results are used to construct a model of convection in the sun. This model explains the generation of both photospheric granules and supergranules and also suggests the existence of giant cells formed near the base of the convection zone. (Author)

AD-750 801 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
FLARE-ASSOCIATED CORONAL EXPANSION PHENOMENA,
Anton Bruzek, and Howard L. Demastus. 13 Jan 70, 12p Rept no. AFCRL-72-0508
Availability: Pub. in Solar Physics, v12 p447-457 1970.

Descriptors: (*Solar flares, Motion), Time studies, Solar corona, Magnetic fields.
Identifiers: Solar magnetic fields.

Two classes of coronal expansion phenomena were studied in Sacramento Peak coronal movies: Slow, slightly decelerated expansion phenomena and fast, accelerated, quasi-exploding arches. The various phenomena were found to be associated with flares in different ways: The slow expansions were long lived post-flare phenomena initiated by the flare; the accelerated expanding arches were either (a) arches expanding prior to and apparently exploding at flare onset, or (b) arches apparently emerging from the flare (probably in its initial phase) and rapidly expanding and exploding, or (c) the expansion and disruption of (originally stable) coronal arches during occurrence of a distant flare. These expansions may be considered as evidence for corresponding flare associated changes in the coronal magnetic field. (Author)

AD-750 802 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
A PHOTOGRAPHIC POLARIMETER FOR SOLAR OBSERVATIONS,
Jacques M. Beckers, and W. J. Wagner. 20 May 70, 3p Rept no. AFCRL-72-0509
Availability: Pub. in Applied Optics, v9 n8 p1933-1934 Aug 70.

Descriptors: (*Astronomy, Instrumentation), (*Solar spectrum, Polarization), Solar eclipses, Solar corona, Optical equipment.
Identifiers: *Polarimeters, *Astronomical instruments, Emission spectra.

The photographic polarimeter used to measure the linear polarization of solar coronal and prominence emission lines at the 7 March 1970 solar eclipse is described. (Author)

AD-750 804 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
THE INTENSITY, VELOCITY AND MAGNETIC STRUCTURE OF A SUNSPOT REGION. IV. PROPERTIES OF A UNIPOLAR SUNSPOT,
J. M. Beckers, and E. H. Schroeter. 3 Jul 69, 21p Rept no. AFCRL-72-0517
Availability: Pub. in Solar Physics, v10 p384-403 1969.

Descriptors: (*Sunspots, Magnetic fields), Intensity, Velocity, Zeeman effect, Doppler effect.
Identifiers: Umbra, Preumbra, Solar magnetic fields.

As part of a detailed study of a sunspot during its disk passage, the authors observed from 20 July 1966 to 1 August 1966 the sunspot numbered 4386 in the Rome monthly bulletin. In this publication the authors will describe the average magnetic and velocity field in this one sunspot as well as fluctuations in these fields associated with penumbral and umbral fine structures.

AD-750 805 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
POWER SPECTRA OF H ALPHA DOPPLER SHIFTS,
Ian Elliott. 21 Jun 68, 17p Rept no. AFCRL-72-0512
Availability: Pub. in Solar Physics, v6 p28-40 1969.

Descriptors: (*Solar spectrum, Doppler effect), (*Chromosphere, Magnetohydrodynamics), Spectra (Visible + ultraviolet), Power spectra, Magnetic fields.
Identifiers: Velocity fields, Solar granulation, Solar magnetic fields.

The temporal characteristics of the chromospheric velocity field in a quiet region are studied by means of a carefully guided sequence of 215 H alpha spectra of the disk center lasting 54 min. The Doppler shifts of each frame delta lambda = 0.4 A are measured and the velocity history of each position on the sun is reconstructed. The velocity power spectrum is found for each of 256 points along the total slit length of 280,000 km. A steady downward velocity is associated with places where the amplitude of the fluctuating velocity is high. The average velocity power spectrum exhibits three main features: (1) A peak at 287 sec, (2) A group of high frequency peaks in the range 150-210 sec, and (3) A low frequency peak with a period of 900 sec. The relationship of these features to the Ca K network is discussed. (Author)

AD-750 806 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
THE EFFECT OF FINITE RESOLUTION ON SOLAR GRANULATION,
Steven Musman. 1 Oct 68, 12p Rept no. AFCRL-72-0520
Availability: Pub. in Solar Physics, v7 p178-186 1969.

Descriptors: (*Solar atmosphere, Photographic images), Photointerpretability, Resolution, Scintillation.
Identifiers: *Solar granulation, Photosphere.

Some numerical experiments were performed in order ot simulate the effect of finite resolution on solar granulation. When a two-dimensional pattern is smeared, another pattern emerges whose nature depends on the width of the smearing function rather than the original pattern. The size of the structures present in a typical granulation photograph is about that which would be expected from the smearing of smaller structures by the effect of atmospheric 'seeing'. Only Stratoscope photographs appear to have unambiguously determined the nature of solar granulation. (Author)

AD-750 807 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
THE PROFILES OF FRAUNHOFER LINES IN THE PRESENCE OF ZEEMAN SPLITTING. II. ZEEMAN MULTIPLETS FOR DIPOLE AND QUADRUPOLE RADIATION,
Jacques M. Beckers. 24 Jul 69, 7p Rept no. AFCRL-72-0516
See also AD-699 284.
Availability: Pub. in Solar Physics, v10 p262-267 1969.

Descriptors: (*Solar spectrum, *Zeeman effect), Quadrupole moments, Magneto-optic effect, Electron transitions, Oxygen, Sunspots, Dipole moments, Sulfur, Atomic spectroscopy.

The radiative transfer equations (LTE) in the four Stokes parameters are derived for the general case of a Zeeman multiplet for both electric and magnetic dipole as well as for electric quadrupole radiation. (Author)

AD-750 808 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass

THE INTENSITY, VELOCITY AND MAGNETIC STRUCTURE OF A SUNSPOT REGION. III. ON THE ORIGIN OF THE APPARENT PI COMPONENT IN SUNSPOT UMBRAE,
Jacques W. Beckers, and E. H. Schroeter. 7 Oct 68, 9p Rept no. AFCRL-72-0515
See also AD-750 804.
Availability: Pub. in Solar Physics, v7 p22-25 1969.

Descriptors: (*Sunspots, Zeeman effect), Magnetic fields, Line spectrum.
Identifiers: Umbra, Solar magnetic fields.

The appearance of the pi component of a normal Zeeman triplet in sunspot umbrae is discussed. The effect of saturation on the shape of the spectral line profile is investigated as a factor in explaining the anomalous behavior of the umbral pi component. (Author)

AD-750 810 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
THE INTERPRETATION OF VELOCITY FILTERGRAMS. I. THE EFFECTIVE DEPTH OF LINE FORMATION,
R. L. Parnell, and Jacques M. Beckers. 13 Mar 69, 5p Rept no. AFCRL-72-0521
Availability: Pub. in Solar Physics, v9 p35-38 1969.

Descriptors: (*Solar spectrum, Doppler effect), Solar atmosphere, Spectra (Visible + ultraviolet), Line spectrum.
Identifiers: Solar granulation, Velocity fields.

The paper describes a numerical experiment in which the effect of an assumed velocity distribution in the solar atmosphere on the intensity difference between a blue- and a red-wing filtergram is derived. This results in the effective optical depth at which the velocity is measured. (Author)

AD-750 811 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
CHROMOSPHERIC INHOMOGENETIES IN SUNSPOT UMBRAE,
Jacques M. Beckers, and Paul E. Tallant. 9 Dec 68, 16p Rept no. AFCRL-72-0519
Availability: Pub. in Solar Physics, v7 p351-365 1969.

Descriptors: (*Sunspots, Solar spectrum), Magnetic fields, Doppler effect, Line spectrum, Chromosphere.
Identifiers: Umbra.

The properties of rapidly changing inhomogeneities visible in the H and K lines above sunspot umbrae are described. (Author)

AD-750 812 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
SOURCE FUNCTIONS OF INFRARED FRAUNHOFER LINES FROM EQUIVALENT WIDTHS,
Richard C. Altrock. 10 Sep 68, 9p Rept no. AFCRL-72-0522
Availability: Pub. in Solar Physics, v7 p3-10 1969.

Descriptors: (*Solar spectrum, Mathematical analysis), Spectra (Infrared), Identification, Sources, Oxygen, Silicon, Line spectrum.

A method for obtaining the source function and value of r (o) identically equal to k (c)/kL, 0 from the variation of equivalent width across the solar the solar disk has been applied to several infrared Fraunhofer lines. The results indicate that most of the lines investigated have non-L.T.E. source functions which are less than or equal to the mean continuum intensity. (Author)

AD-750 813 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
SACRAMENTO PEAK MAGNETOGRAPH,
Richard B. Dunn. 1971, 7p Rept no. AFCRL-72-0571
Availability: Pub. in Solar Magnetic Fields, p65-70 1971.

Descriptors: (*Solar spectrum, Spectrum analyzers), Astronomical observatories, New Mexico, Doppler effect, Zeeman effect, Recording systems, Polarization.
Identifiers: *Magnetographs, *Astronomical instruments.

The Sac Peak magnetograph (DZA) has been modifed from Evans' original scheme so that it measures the displacement of the right and left hand circularly polarized lines separately. The computer reduction calculates the Zeeman and radial velocity signals. A grating servo system has been added to correct for slow temperature drifts in the spectrograph. A paper-tape reader controls the raster scan and the formatting of data on to magnetic tape. (Author)

AD-750 831 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
SOLAR MAGNETIC FIELD MEASUREMENTS USING BABINET COMPENSATORS,
Jacques M. Beckers, and J. O. Stenflo. 17 Oct 68, 3p Rept no. AFCRL-72-0518
Availability: Pub. in Solar Physics, v6 p480-481 1969.

Descriptors: (*Solar atmosphere, Magnetic fields), Instrumentation, Reliability.
Identifiers: *Solar magnetic fields, *Astronomical instruments.

The use of a Babinet compensator to measure solar magnetic fields by means of the fringe pattern produced in a spectroheliogram is described. (Author)

AD-750 832 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
OBSERVATIONS AND INTERPRETATION OF SUPERGRANULE VELOCITY AND MAGNETIC FIELDS,
Steven Musman. 1971, 6p Rept no. AFCRL-72-0507
Presented at the International Astronomical Union Symposium No. 43, Held at the College de France, Paris, France, 31 Aug-4 Sep 70.
Availability: Pub. in Solar Magnetic Fields, p289-292 1971.

Descriptors: (*Solar atmosphere, Magnetic fields), Magnetohydrodynamics, Velocity.
Identifiers: *Solar granulation, *Solar magnetic fields, Velocity fields.

In the report the author considers the observed concentrations of vertical velocity and vertical magnetic field in the corners of the coarse network. Using a horizontal velocity inferred from the vertical velocity, the author computed the possible rate of concentration of the field. The rate turns out to be much higher than observed. It is concluded that the observed motions in supergranules are not concentrating the observed field at the corners of the network. It is suggested four possible alternative situations consistent with the observations.

N72-28440 PC$5.75/MF$0.95
Geological Survey, Washington, D.C.
PRELIMINARY CATALOG OF PICTURES TAKEN ON THE LUNAR SURFACE DURING THE APOLLO 16 MISSION.
R. M. Batson, K. B. Carson, V. S. Reed, and R. L. Tyner. 19 May 72, 72p NASA-CR-127635, USGS-IR-NASA-50
NASA ORDER T-5874-A

Descriptors: *Apollo 16 flight, *Catalogs, *Lunar landing modules, *Lunar photographs, Lunar exploration, Lunar topography.

For abstract, see STAR 10 19.

N72-28473 PC$3.75/MF$0.95
Swiss Inst. of Meteorology, Zurich.
THE VARIOUS MEASURING METHODS FOR DETERMINING RADIATION INTENSITY WITH THE COMPENSATION PYRHELIOMETER AND THE DEVELOPMENT OF AN IMPROVED MODEL . DIE VERSCHIEDENEN MESSVERFAHREN ZUR BESTIMMUNG DER STRAHLUNGSINTENSITAET MIT DEM KOMPENSATIONSPYRHELIOMETER UND DIE ENTWICKLUNG EINES VERBESSERTEN MODELLS.
C. Froehlich, and H. Wierzejewski. 1972, 33p
PUBL-25
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Optical equipment, *Pyrheliometers, *Solar radiation, Equipment specifications, Measuring instruments, Product development.

For abstract, see STAR 10 19.

N72-28803 PC$3.00/MF$0.95
Belgian Royal Observatory, Brussels. Dept. of Radio Astronomy and Solar Physics.
RADIOELECTRIC SOLAR ACTIVITY IN 1968 RADIOELECTRIC SOLAR OBSERVATIONS OF 600 MHZ, PART 2 . LACTIVITE RADIOELECTRIQUE SOLAIRE EN 1968. OBSERVATIONS RADIOELECTRIQUES SOLAIRES SUR 600 MHZ.
Annual Report
C. Gonze-delys, and R. Gonze. 1971, 18p
COMMUN-ORB-SER-B-50, AR-29-PT-2
Subm- Its Ciel Et Terre, No. 6, 1971

Descriptors: *Radio astronomy, *Solar activity, Electric fields, Graphs (charts), Tables (data).

For abstract, see STAR 10 19.

N72-28804 PC$3.25/MF$0.95
Belgian Royal Observatory, Brussels. Dept. of Radio Astronomy and Solar Physics.
RADIOELECTRIC SOLAR ACTIVITY IN 1969 RADIOELECTRIC SOLAR OBSERVATIONS OF 600 MHZ, PART 2 . LACTIVITE RADIOELECTRIQUE SOLAIRE EN 1969. OBSERVATIONS RADIOELECTRIQUES SOLAIRES SUR 600 MHZ.
Annual Report
C. Gonze. 1972, 24p COMMUN-ORB-SER-B-61, AR-30-PT-2
Subm- Its Ciel Et Terre, No. 1, 1972

Descriptors: *Radio astronomy, *Solar activity, Electric fields, Graphs (charts), Tables (data).

For abstract, see STAR 10 19.

N72-28805 PC$3.00/MF$0.95
Belgian Royal Observatory, Brussels.
RADIOELECTRIC SOLAR ACTIVITY IN 1966 . ACTIVITE RADIOELECTRIQUE SOLAIRE EN 1966.
C. Delys, and R. Gonze. 1971, 11p
COMMUN-ORB-SER-B-32
Subm- Its Ciel Et Terre, V. 87, No. 4, 1971

Descriptors: *Radio astronomy, *Solar activity, Electric fields, Graphs (charts), Tables (data).

For abstract, see STAR 10 19.

N72-28809 PC$3.00/MF$0.95
Techtran Corp., Glen Burnie, Md.

BOLOMETRIC MEASUREMENTS OF RELIC RADIATION.
V. A. Soglasnova, and G. B. Sholomitskiy. Jul 72, 6p NASA-TT-F-14375, PR-90
Contract NASW-2037
Tran- Transl. Into English From O Bolometricheskik Izmereniyakh Reliktovogo Izlucheniya, Rept. Pr-90 Inst. of Space Res., Acad. Sci. USSR, Moscow, 1971 P 3-8

Descriptors: *Anisotropy, *Background radiation, *Bolometers, Cosmology, Relativistic velocity.

For abstract, see STAR 10 19.

N72-28810 PC$3.25/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
SOUNDING OF THE SOLAR CORONA BY MONOCHROMATIC RADIO RADIATION.
O. G. Onishchenko. Jul 72, 22p
NASA-TT-F-14347, PR-73
Contract NASW-2038
Tran- Transl. Into English From Zondirovaniye Solnechnoy Korony Monokhromaticheskim Radioizlucheniyem, Inst. of Space Res., Acad. of Sci., Moscow, Report Pr-73, 1971 30 P

Descriptors: *Monochromatic radiation, *Radio waves, *Solar corona, *Solar wind, Electron density (concentration), Interplanetary medium, Solar magnetic field.

For abstract, see STAR 10 19.

N72-28811 PC$3.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
LOW INTENSITY BALMER EMISSIONS FROM THE INTERSTELLAR MEDIUM AND GEOCORONA.
R. J. Reynolds, F. L. Roesler, and F. Scherb. Jun 72, 21p NASA-TM-X-65967, X-672-72-259
Subm- Submitted for Publication

Descriptors: *Fabry-perot spectrometers, *H alpha line, *H beta line, *Intergalactic media, *Night sky, Balmer series, Emission spectra, Galactic radiation.

For abstract, see STAR 10 19.

N72-28812 PC$4.25/MF$0.95
California Univ., Berkeley.
ENERGETIC RADIATIONS FROM SOLAR FLARES.
Final Report, Mar. 1968 - Aug. 1971
K. A. Anderson. Aug 71, 42p NASA-CR-122509, SSL-SER-13-ISSUE 50
Contract NAS5-9094

Descriptors: *Charged particles, *Experimental design, *Ogo-e, *Radiation measurement, *Solar flares, Alpha particles, Electrons, Protons, Satellite-borne instruments, Solar x-rays.

For abstract, see STAR 10 19.

N72-28817 PC$3.25/MF$0.95
Chicago Univ., Ill.
HIGH VOLTAGE ELECTRON MICROSCOPY AND ELECTRON DIFFRACTION OF PYROXENES IN TYPE B LUNAR SAMPLES FROM APOLLO 11.
H. Fernandez-moran, M. Ohtsuki, S. S. Hafner, and D. Virgo. 8 Dec 69, 23p NASA-CR-127444
Contract NGL-14-001-012
Conf- Presented At Apollo 11 Lunar Sci. Conf., Houston, Tex., 5-8 Jan. 1970

Descriptors: *Band structure of solids, *Lunar rocks, *Microstructure, *Pyroxenes, Apollo 11 flight, Crystal lattices, Electron diffraction, Electron microscopes, Magnetic domains.

For abstract, see STAR 10 19.

N72-28819 PC$10.75/MF$0.95
Mobil Research and Development Corp., Dallas, Tex. Field Research Lab.
NEUTRON DIE-AWAY EXPERIMENT FOR REMOTE ANALYSIS OF THE SURFACE OF THE MOON AND THE PLANETS, PHASE 3.
Final Report, 1 Jun. 1970 - 30 Nov. 1971
W. R. Mills, and L. S. Allen. 16 Jun 72, 174p
NASA-CR-127439
Contract NASW-1435

Descriptors: *Lunar topography, *Planetary surfaces, *Prediction analysis techniques, *Thermal neutrons, *Variance (statistics), Absorption cross sections, Helium, Least squares method, Statistical analysis.

For abstract, see STAR 10 19.

N72-28820 PC$4.50/MF$0.95
Kansas State Univ., Manhattan. Dept. of Physics.
INFRARED LABORATORY STUDIES OF SYNTHETIC PLANETARY ATMOSPHERES.
Semiannual Status Report, 1 Dec. 1971 - 31 May 1972
D. Williams. 20 Jun 72, 47p NASA-CR-127684
Contract NGR-17-001-026

Descriptors: *Atmospheric composition, *Gases, *Infrared radiation, *Planetary atmospheres, Absorptance, Carbon monoxide, Earth atmosphere, Helium, Hydrogen, Nitric acid, Nitrogen oxides, Transmittance.

For abstract, see STAR 10 19.

N72-28821 PC$4.00/MF$0.95
South Carolina Univ., Columbia. Dept. of Chemistry.
INFRARED SPECTRA OF MOLECULES AND MATERIALS OF ASTROPHYSICAL INTEREST.
Quarterly Progress Report, 15 Dec. 1971 - 15 Mar. 1972
J. R. Durig. Mar 72, 40p NASA-CR-127634, QPR-19
Contract NGR-41-002-033

Descriptors: *Acetaldehyde, *Vibrational spectra, Color, Jupiter atmosphere.

For abstract, see STAR 10 19.

N72-28822 PC$3.75/MF$0.95
California Univ., Berkeley. Space Sciences Lab.
LUNAR SOIL PROPERTIES AND SOIL MECHANICS.
Semiannual Status Report, 20 Dec. 1971 - 20 Jun. 1972
J. K. Mitchell, W. N. Houston, and H. J. Hovland. Jun 72, 35p NASA-CR-127637, SSL-SER-13-ISSUE-60
Contract NGR-05-003-406

Descriptors: *Lunar evolution, *Lunar geology, *Lunar soil, *Physical properties, Apollo flights, Dynamic loads, Dynamic response, Loads (forces), Simulation, Static loads.

For abstract, see STAR 10 19.

N72-28823 PC$15.75/MF$0.95
Geological Survey, Washington, D.C.
DOCUMENTATION OF APOLLO 15 SAMPLES.
R. L. Sutton, M. H. Hait, K. B. Larson, G. A. Swann, and V. S. Reed. Apr 72, 275p
NASA-CR-127639, USGS-IR-NASA-47
NASA ORDER T-65253-G

Descriptors: *Apollo 15 flight, *Lunar exploration, *Lunar photography, Indexes (documentation), Orientation.

For abstract, see STAR 10 19.

N72-28824 PC$16.00/MF$0.95
Geological Survey, Washington, D.C.
DOCUMENTATION AND ENVIRONMENT OF THE APOLLO 16 SAMPLES A PRELIMINARY REPORT.
26 May 72, 279p NASA-CR-127638, USGS-IR-NASA-51
NASA ORDER T-5874-A

Descriptors: *Apollo 16 flight, *Lunar photography, *Lunar rocks, Catalogs (publications), Lunar geology, Lunar topography.

For abstract, see STAR 10 19.

N72-28825 PC$3.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
MORPHOLOGY OF LUNAR ROCKS IN THE REGION TRANSVERSED BY LUNOKHOD 1.
R. B. Zezin, and A. T. Bazilevskiy. Apr 72, 7p
NASA-TT-F-14179
Tran- Transl. Into English From Priroda (Moscow), No. 1, Nov. 1971 P 7-9

Descriptors: *Lunar rocks, *Lunokhod lunar roving vehicles, *Morphology, Lunar evolution, Lunar topography.

For abstract, see STAR 10 19.

N72-28830 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MASS INFLUX OBTAINED FROM LLLTV OBSERVATIONS OF FAINT METEORS.
R. J. Naumann, and K. S. Clifton. Jul 72, 23p
NASA-TN-D-6868, M-445
Conf- Presented At Iau Colloq. No. 13, the Evolutionary and Phys. Probl. of Meteorids, Albany

Descriptors: *Mass distribution, *Meteor trails, *Television systems, Data correlation, Flux (rate), Luminosity, Satellite observation, Velocity distribution.

For abstract, see STAR 10 19.

N72-28833 PC$6.75/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
FIVE-YEAR PLAN FOR SPACE RESEARCH.
F. K. Schroeder. Jul 72, 91p NASA-TT-F-14331
Tran- Transl. Into English From Arbeitsgemeinschaft Weltraumforsch. (Munich), Feb. 1972 87 P

Descriptors: *Biophysics, *Extraterrestrial environments, Astrophysics, Earth atmosphere, Eclipses, Research facilities, Systems engineering.

For abstract, see STAR 10 19.

N72-28834 PC$3.50/MF$0.95
Techtran Corp., Glen Burnie, Md.
ON THE POSSIBILITY OF CREATING A MICROCLIMATE ON A SECTION OF THE LUNAR SURFACE.
I. T. Atmanov. Jul 72, 26p NASA-TT-F-14376, PR-188
Contract NASW-2037
Tran- Transl. Into English From Acad. of Sci., Inst. of Space Res., Moscow, Report Pr-188

Descriptors: *Lunar topography, *Microclimatology, *Temperature distribution, Thermal conductivity, Thermal insulation, Thermal stability.

For abstract, see STAR 10 19.

N72-28837 PC$3.75/MF$0.95
Mcdonnell-douglas Astronautics Co., Huntington Beach, Calif.
MICROPHYSICAL, MICROCHEMICAL AND ADHESIVE PROPERTIES OF LUNAR MATERI-

AL. 3 GAS INTERACTION WITH LUNAR MATERIAL.
J. J. Grossman, N. R. Mukherjee, and J. A. Ryan. 1972, 34p NASA-CR-115707
Contract NAS9-11680

Descriptors: *Lunar rocks, *Reactivity, Adsorption, Chemical properties, Low temperature, Nitrogen, Oxygen, Water vapor.

For abstract, see STAR 10 19.

N72-28843 PC$4.25/MF$0.95
California Univ., Berkeley. Space Sciences Lab.
LUNAR SOIL PROPERTIES AND SOIL MECHANICS. FLOW IN POROUS MEDIA UNDER RAREFIED GAS CONDITIONS. RESEARCH PHASE FLUID CONDUCTIVITY OF LUNAR SURFACE MATERIALS.
Final Report
F. C. Hurlbut, and C. R. Jih. May 72, 44p
NASA-CR-122506, SSL-SER-13-ISSUE-43
Contract NGR-05-003-406

Descriptors: *Continuum flow, *Free molecular flow, *Lunar rocks, *Lunar soil, *Transition flow, Beads, Flow theory, Gas flow, Sandstones.

For abstract, see STAR 10 19.

N72-28846 PC$3.00/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
POSITION OF THE LUNAR CENTER OF MASS ACCORDING TO PHOTOGRAMMETRIC ANALYSIS AND LUNAR ORBITER 1 DATA.
Y. N. Lipskiy, V. A. Nikonov, and T. P. Skobeleva. Aug 72, 5p NASA-TT-F-14514
Contract NASW-2038
Tran- Transl. Into English From Kosmich. Issled. (Moscow), V. 10, Jan - Feb., 1972 P 141-142

Descriptors: *Celestial reference systems, *Center of gravity, *Lunar orbiter, *Moon, *Photogrammetry, Lunar photography, Physical properties, Selenology.

For abstract, see STAR 10 19.

N72-28848 PC$3.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A DISCUSSION OF CO AND O ON VENUS AND MARS.
M. Shimizu. Jun 72, 24p NASA-TM-X-65950, X-620-72-209
Subm- Submitted for Publication

Descriptors: *Atmospheric chemistry, *Carbon monoxide, *Mars atmosphere, *Oxygen atoms, *Venus atmosphere, Atmospheric models, Chemical reactions, Hydrogen, Oxygen, Ultraviolet absorption.

For abstract, see STAR 10 19.

N72-28849 PC$3.75/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MAGNETIC COERCIVITY AND FERROMAGNETIC SPECIES IN LUNAR MATERIALS.
P. Wasilewski. Jun 72, 34p NASA-TM-X-65953, X-644-72-162
Subm- Submitted for Publication

Descriptors: *Coercivity, *Ferromagnetic materials, *Hysteresis, *Lunar rocks, *Lunar soil, Fines, Magnetic properties, Meteorites.

For abstract, see STAR 10 19.

N72-28852 PC$3.00/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
PECULIARITIES OF LUNAR STUDIES BY RADIOSONDE OBSERVATION FROM THE SURFACE.
V. V. Andreyanov. Aug 72, 16p
NASA-TT-F-14374
Contract NASW-2038
Tran- Transl. Into English of Osobennosti Issledovaniya Luny Metodami Radiozondirovaniya S Poverkhnosti, Rept. Pr-94 Inst. of Space Res., Academy of Sci. USSR, Moscow, 1972 21 P

Descriptors: *Electrical properties, *Impedance measurements, *Lunar topography, *Radiosondes, Radio frequencies, Reflected waves, Wave propagation.

For abstract, see STAR 10 19.

N72-28853 PC$3.00/MF$0.95
Royal Observatory, Edinburgh (Scotland).
REPORT OF THE ASTRONOMER ROYAL FOR SCOTLAND FOR THE YEAR ENDING 31 MARCH 1972.
1972, 15p

Descriptors: *Infrared astronomy, *Interstellar matter, *Stellar spectrophotometry, *Ubv spectra, *Ultraviolet photometry, Interferometry, Skylark rocket vehicle, Star clusters, Td-1 satellite.

For abstract, see STAR 10 19.

N72-28854 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
EXPERIMENTAL DETERMINATION OF POTENTIAL LUNAR SURFACE ORGANIC CONTAMINATION IN THE LUNAR MODULE DESCENT ENGINE EXHAUST.
D. A. Flory, B. R. Simoneit, A. L. Burlingame, and I. D. Smith. Aug 72, 94p NASA-TR-R-389, MSC-S-233

Descriptors: *Contamination, *Exhaust gases, *Lunar landing, *Lunar module, Nitrogen compounds, Rocket engines, Sampling.

For abstract, see STAR 10 19.

N72-29169 PC$3.00/MF$0.95
Academy of Sciences (USSR, Moscow. Inst. for Space Research.
UTILIZATION OF REDUNDANCY REDUCTION SYSTEM WITH ZERO-ORDER PREDICTOR FOR STUDY OF EPISODIC PROCESSES.
E. M. Vassiliev, B. S. Novicov, V. A. Olshevski, and Y. M. Shtarkov. 1972, 19p PR-95

Descriptors: *Data reduction, *Redundancy, *Satellite-borne instruments, *Solar radio bursts, *Stochastic processes, French space programs, Predictions, Pulses, U.S.S.R. space program.

For abstract, see STAR 10 20.

N72-29818 PC$11.50/MF$0.95
California Inst. of Tech., Pasadena.
SOLAR FLARE PARTICLE PROPAGATION COMPARISON OF A NEW ANALYTIC SOLUTION WITH SPACECRAFT MEASUREMENTS.
Ph.D. Thesis
J. E. Lupton. 1972, 188p NASA-CR-122406
Contracts NAS5-9312, NGR-05-002-160

Descriptors: *Fokker-planck equation, *Solar flares, *Solar protons, Magnetic fields, Ogo-f, Particle diffusion, Solar cosmic rays.

For abstract, see STAR 10 20.

N72-29823 PC$7.00/MF$0.95
California Univ., Berkeley. Space Sciences Lab.
INSTRUMENT REPORT PLANETARY X-RAY EXPERIMENT.
K. A. Anderson. 28 Jan 72, 100p
NASA-CR-127798, SSL-SER-1
Contract NGR-05-003-458

Descriptors: *Cosmic rays, *Magnetosphere, *Planetary magnetic fields, *Proportional counters, *Solid state devices, *X rays, Collimation, Radiation detectors, Radiation shielding, Radiation sources.

For abstract, see STAR 10 20.

N72-29824 PC$5.75/MF$0.95
IIT Research Inst., Chicago, Ill. Astro Sciences.
PHOTOMETRIC STUDIES OF SATURNS RING AND ECLIPSES OF THE GALILEAN SATELLITES.
Final Report
W. E. Brunk. 21 Apr 72, 75p NASA-CR-127459
Contract NASW-2257

Descriptors: *Planetary atmospheres, *Scattering functions, *Visual photometry, Eclipses, Jupiter atmosphere, Natural satellites, Optical thickness, Saturn rings.

For abstract, see STAR 10 20.

N72-29828 PC$3.00/MF$0.95
Santa Clara Univ., Calif.
PLANETARY GEOLOGY, STELLAR EVOLUTION AND GALACTIC COSMOLOGY.
Final Technical Report, 1 Jun. 1971 - 31 May 1972
31 May 72, 6p NASA-CR-127796
Contract NGR-05-017-027

Descriptors: *Cosmology, *Galaxies, *Lunar geology, *Stellar evolution, Balmer series, Basalt, Paschen series, Planetology, Positronium.

For abstract, see STAR 10 20.

N72-29831 PC$3.00/MF$0.95
Texas Univ., Austin.
STUDY OF OPTICAL PROPERTIES OF X-RAY SOURCES.
Final Report
P. A. Vandenbout. 30 Jun 72, 19p
NASA-CR-127771, CONTRIB-66
Contract NGR-44-012-209

Descriptors: *Optical measurement, *Radio sources (astronomy), *X ray density measurement, Cygnus constellation, Satellite observation, Satellite-borne photography, Scorpius constellation, Uhuru satellite, X ray astronomy.

For abstract, see STAR 10 20.

N72-29832 PC$4.00/MF$0.95
Texas Univ., Austin.
REPORT ON THE LUNAR RANGING AT MCDONALD OBSERVATORY.
Technical Report, 16 Feb. 1972 - 15 May 1972
E. C. Silverberg, and J. R. Wiant. May 72, 37p
NASA-CR-127788, RM-72-007
Contract NGR-44-012-165

Descriptors: *Earth-moon system, *Gas lasers, *Laser range finders, Loran c, Lunar landing sites, Photomultiplier tubes.

For abstract, see STAR 10 20.

N72-29834 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
PHYSICAL CHARACTERISTICS OF THE GIANT PLANETS.
V. G. Teyfel. Jun 72, 227p NASA-TT-F-717
Contract NASW-2035

Tran- Transl. Into English of the Book Fizicheskiye Kharakteristiki Planet-gigantov Alma Alta, Nauka, 1971

Descriptors: *Astronomy, *Planetary atmospheres, *Planetary environments, *Planetary surfaces, Extraterrestrial radiation, Solar system, Tables (data).

For abstract, see STAR 10 20.

N72-29836 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
OPTICAL DEPTHS IN THE INTERSTELLAR AND INTERGALACTIC MEDIA.
K. Schocken. Jul 72, 10p NASA-TM-X-64683

Descriptors: *Extraterrestrial radiation, *Interstellar space, *X rays, Extraterrestrial matter, Supernovae, Tables (data).

For abstract, see STAR 10 20.

N72-29837 PC$3.75/MF$0.95
Techtran Corp., Glen Burnie, Md.
DIELECTRIC PERMEABILITY AND DENSITY OF THE SUBSTANCE OF THE SURFACE LAYER OF MARS.
N. N. Krupenio, and N. Y. Shapirovskaya. Aug 72, 34p NASA-TT-F-14369
Contract NASW-2037
Tran- Transl. Into English of Dielektricheskaya Pronitsayemost I Plotnost Veshchestva Poverkhn. Sloya Marsa Rept. Pr-78 Acad. Sci. USSR, Moscow, 1971 40 P

Descriptors: *Density measurement, *Dielectric permeability, *Mars (planet), *Radar measurement, Decimeter waves, Lunar soil, Radar data, Superhigh frequencies, Surface properties, Venus (planet).

For abstract, see STAR 10 20.

N72-29840 PC$3.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
THE PLANET SATURN (1970).
Space Vehicle Design Criteria (Environment) Jun 72, 103p NASA-SP-8091

Descriptors: *Electromagnetic radiation, *Planetary atmospheres, *Planetary environments, *Saturn (planet), *Spacecraft design, Charged particles, Natural satellites, Planetary gravitation, Saturn rings, Solar wind.

For abstract, see STAR 10 20.

N72-29842 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NOTE ON THE ORIGIN OF JUPITERS MAGNETIC FIELD.
K. Sakurai. Jul 72, 15p NASA-TM-X-65977, X-693-72-253

Descriptors: *Coriolis effect, *Jupiter (planet), *Magnetohydrodyaamics, Convection, Magnetic fields.

For abstract, see STAR 10 20.

N72-29843 PC$3.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
APOLLO 16 GEOCHEMICAL X-RAY FLUORESCENE EXPERIMENT PRELIMINARY REPORT.
I. Adler, J. Trombka, J. Gerard, P. Lowman, and R. Schmadebeck. Jun 72, 23p NASA-TM-X-65976, X-641-72-246

Descriptors: *Apollo 16 flight, *Geochemistry, *Mapping, Apollo 15 flight, Lunar composition, X ray analysis.

For abstract, see STAR 10 20.

N72-30393 PC$3.00/MF$0.95
Techtran Corp., Glen Burnie, Md.
CALCULATION OF THE VISIBLE CHARACTERISTICS OF PHOTOGRAPHIC OBJECTS. EXAMPLES OF PHOTOGRAPHY OF THE SURFACE OF VENUS.
A. S. Panfilov. Aug 72, 19p NASA-TT-F-14370
Contract NASW-2037
Tran- Transl. Into English the Publ. Raschet Opticheskikh Kharakteristik Obyektov Syemki Primer Syemki Poverkhnosti Venery Moscow, Acad. of Sci., 1972 26 P

Descriptors: *Light (visible radiation), *Numerical analysis, *Photographic measurement, *Venus (planet), Image contrast, Monochromatization, Planetary surfaces.

For abstract, see STAR 10 21.

N72-30669 PC$3.00/MF$0.95
Academy of Sciences (USSR, Moscow. Inst. for Space Research.
SOLAR PLASMA INTERACTION WITH MARS PRELIMINARY RESULTS.
O. L. Vaisberg, A. V. Bogdanov, N. F. Borodin, A. A. Zertzalov, and B. V. Polenov. 1972, 12p D-143
Conf- Presented At the 15th Cospar Meeting, Madrid, 1972

Descriptors: *Ion density (concentration), *Mars atmosphere, *Plasma interactions, *Shock waves, Collisionless plasmas, Ion motion, Ion temperature, Satellite observation, Shock fronts, Solar wind.

For abstract, see STAR 10 21.

N72-30785 PC$3.00/MF$0.95
Stanford Univ., Calif.
MECHANICAL-WAVE DISSIPATION IN THE LOWER CORONA EMPIRICAL REQUIREMENTS FOR QUIET REGIONS.
R. L. Moore. Jun 72, 10p NASA-CR-127345, SU-IPR-476
Contract NGL-05-020-272

Descriptors: *Damping, *Solar corona, *Temperature distribution, *Wave attenuation, Chromosphere, Heating, Photosphere, Solar radiation.

For abstract, see STAR 10 21.

N72-30786 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE MODULATION OF LOW ENERGY GALACTIC COSMIC RAYS OVER SOLAR MAXIMUM (CYCLE 20).
M. A. Vanhollebeke, J. R. Wang, and F. B. Mcdonald. Aug 72, 14p NASA-TM-X-65989, X-660-72-292
Subm- Submitted for Publication

Descriptors: *Cosmic rays, *Galactic radiation, *Solar activity, Alpha particles, Protons.

For abstract, see STAR 10 21.

N72-30787 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ON THE ACCELERATION OF HIGH-ENERGY PARTICLES IN SOLAR FLARES.
K. Sakurai. Aug 72, 19p NASA-TM-X-65992, X-693-72-264

Descriptors: *Particle acceleration, *Solar flares, *Solar protons, *Type 4 bursts, Electrons, Flux (rate), Microwaves.

For abstract, see STAR 10 21.

N72-30788 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
RECURRENT ACTIVE REGIONS RELATED TO METRIC RADIO CONTINUUM EMISSIONS AND THE INTERPLANETARY MAGNETIC SECTOR STRUCTURE.
K. Sakurai. Sep 72, 16p NASA-TM-X-65999, X-693-72-294

Descriptors: *Continuums, *Solar activity, *Solar magnetic field, Noise storms, Solar rotation, Statistical analysis.

For abstract, see STAR 10 21.

N72-30814 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
KINEMATICS OF THE HUYGENIAN REGION OF THE ORION NEBULA.
D. Fischel, and W. A. Feireman. Aug 72, 17p NASA-TM-X-65994, X-670-72-291

Descriptors: *Astronomical maps, *Nebulae, *Orion constellation, *Radial velocity, Astrophysics, Line spectra, Oxygen, Stellar spectra.

For abstract, see STAR 10 21.

N72-30815 PC$4.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
INVESTIGATION OF THE MARTIAN ENVIRONMENT BY INFRARED SPECTROSCOPY ON MARINER 9.
H. R. Conrath, B. J. Conrath, W. Novis, V. Kunde, and P. Lowman. Jul 72, 42p
NASA-TM-X-65993, X-620-72-280
Subm- Prepared in Cooperation With Biospherics, Inc. and Jpl

Descriptors: *Infrared spectroscopy, *Mariner 9 space probe, *Mars atmosphere, *Mars surface, Atmospheric circulation, Atmospheric composition, Diurnal variations, Dust, Silicon dioxide, Surface properties, Water vapor.

For abstract, see STAR 10 21.

N72-30821 PC$5.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
JUPITERS RADIATION BELTS AND THE SWEEPING EFFECT OF ITS SATELLITES.
G. D. Mead, and W. N. Hess. Aug 72, 64p
NASA-TM-X-65986, X-641-72-274
Subm- Submitted for Publication

Descriptors: *Jupiter (planet), *Natural satellites, *Radiation belts, Diffusion, Electrons, Proton belts, Trapped particles.

For abstract, see STAR 10 21.

N72-30830 PC$3.75/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
THE FACE OF MARS MARINER 9.
R. Steinbacker. Jun 72, 33p NASA-CR-128028, JPL-TM-33-559
Contract NAS7-100

Descriptors: *Mariner 9 space probe, *Mars atmosphere, *Mars environment, *Mars surface, Phobos, Polar caps, Spaceborne photography, Topography.

For abstract, see STAR 10 21.

N72-30835 PC$14.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
LINE-BLANKETED MODEL STELLAR ATMOSPHERES APPLIED TO SIRIUS.
Ph.D. Thesis - Maryland Univ.
J. W. Fowler. Aug 72, 241p NASA-TM-X-66005, X-670-72-303

Descriptors: *Absorption spectra, *Atmospheric models, *Stellar atmospheres, Astronomical models, H gamma line, Hydrogen, Line spectra, Opacity.

For abstract, see STAR 10 21.

N72-30839 PC$3.00/MF$0.95
Mons Univ. (Belgium). Dept. Dastrophysique.
BRIGHT STARS CHARTS IN ECLIPTIC COORDINATES WITH MAGNITUDES AT 2000 ANGSTROMS.
L. Houziaux, and G. Houziaux. 1972, 14p
COMMUN-26

Descriptors: *Astronomical maps, *Ecliptic, *Ultraviolet radiation, Astronomical coordinates, Main sequence stars.

For abstract, see STAR 10 21.

N72-30840 PC$3.00/MF$0.95
Academy of Sciences (USSR, Moscow.
RESULTS OF RADAR EXPERIMENTS PERFORMED ON AUTOMATIC STATIONS LUNA-16 AND LUNA-17.
N. N. Kroupenio. 1972, 15p D-131
Conf- Presented At the 15th Cospar Meeting, Madrid, May 1972

Descriptors: *Backscattering, *Lunar topography, *Lunik 16 lunar probe, *Lunik 17 lunar probe, *Radar cross sections, *Radio altimeters, Density (mass/volume), Dielectric permeability, Diffuse radiation, Lssm, Lunar landing sites, Lunar radar echoes, Lunar rocks, Radio scattering, Reflectance.

For abstract, see STAR 10 21.

N72-30841 PC$3.00/MF$0.95
Academy of Sciences (USSR, Moscow. Inst. for Space Research.
SORPTION PROCESSES ON THE LUNAR SURFACE.
V. A. Kotchnev, M. D. Nussinov, E. M. Rudnitzki, Y. A. Surkov, and V. V. Shvarev. 1972, 11p D-132
Conf- Presented At the 15th Cospar Meeting, Madrid, 1972

Descriptors: *Adsorption, *Desorption, *Diurnal variations, *Lunar atmospheres, *Lunar dust, Gases, Lunar topography, Pressure distribution, Temperature distribution.

For abstract, see STAR 10 21.

N72-30842 PC$3.00/MF$0.95
Academy of Sciences (USSR, Moscow. Inst. for Space Research.
PRELIMINARY RESULTS OF MEASUREMENTS OF UV-EMISSION SCATTERED IN THE MARTIAN UPPER ATMOSPHERE.
N. N. Dementyeva, V. G. Kurt, A. S. Smirnov, L. G. Titarchuk, and S. D. Chuvahin. 1972, 20p D-139

Descriptors: *Mars atmosphere, *Mars probes, *Ultraviolet radiation, Atmospheric density, Hydrogen, Onboard equipment, Radiant flux density, Radiation measuring instruments, Radiative transfer, Scattering, Water vapor.

For abstract, see STAR 10 21.

N72-30843 PC$4.00/MF$0.95
Academy of Sciences (USSR, Moscow. Inst. for Space Research.
PRELIMINARY RESULTS OF THE ASTROPHYSICAL OBSERVATIONS OF MARS FROM AIS MARS-3.
V. I. Moroz, and L. V. Ksanfomaliti. 1972, 37p D-142

Descriptors: *Infrared radiation, *Mars atmosphere, *Mars probes, *Mars surface, Astrophysics, Brightness, Carbon dioxide, Dust, Photometers, Radiometers, Satellite observation, Surface temperature, U.S.S.R. space program, Water vapor.

For abstract, see STAR 10 21.

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-750 395 PC$3.00/MF$0.95
Mission Research Corp Santa Barbara Calif
AN ANALYTIC MODEL FOR NUCLEAR INDUCED D-REGION CHEMISTRY.
Final rept.,
Murray Scheibe. Oct 72, 103p Rept no. MRC-R-24 DNA-2920F
Contract DASA01-71-C-0136

Descriptors: (*Ionosphere, *Nuclear explosions), Reaction kinetics, Airburst, Gas ionization, X rays, Mathematical analysis, Nitrogen oxides, Atoms, Nitrogen, Oxygen, Excitation, Ozone.
Identifiers: D region, *Aeronomy, Photoionization, Nitrogen atoms, Oxygen atoms.

Analytic expressions are developed describing the behavior of the neutral and ion chemistry in the D-region following a nuclear burst. The results obtained using these expressions are compared at various altitudes to the results given by a coupled reaction rate code which numerically solves the differential equations involved. The areas which need improvement are discussed. (Author)

AD-750 404 PC$3.00/MF$0.95
Minnesota Univ Minneapolis School of Physics and Astronomy
THE DISTRIBUTION OF ATMOSPHERIC OZONE DERIVED FROM OPTICAL EXTINCTION MEASUREMENTS,
Homer T. Mantis. Sep 72, 27p
Contract N00014-67-A-0113-0004

Descriptors: (*Upper atmosphere, *Ozone), Concentration (Chemistry), Distribution, Spectra (Visible + ultraviolet), Atmospheric sounding, Diurnal variations.
Identifiers: Absorptivity.

Simultaneous measurements of the ozone profile and the solar extinction in the Chappuis bands have been used to obtain an absorption coefficient for calculating the ozone distribution from extinction measurements. The absorption coefficient was found to exhibit line absorption characteristics, but at moderate absorber paths, the absorption coefficient varied only slowly so that satisfactory ozone profiles can be obtained in the atmosphere below the balloon. At short absorber paths uncertainties in the absorption coefficient restricted the accuracy of the ozone calculation but the observations do detect a variation in the ozone concentration above the balloon from sunrise to sunset. (Author)

AD-750 422 Reprint
Minnesota Univ Minneapolis School of Physics and Astronomy
OBSERVATIONS OF HYDROSTATIC INSTABILITY IN THE FREE ATMOSPHERE,
H. T. Mantis. 4 Jan 72, 6p
Contract N00014-67-A-0113-0004
Availability: Pub. in the Jnl. of Geophysical Research, v77 n24 p4539-4544, 20 Aug 72.

Descriptors: (*Lapse rate, Atmospheric sounding), (*Atmospheric temperature, Atmospheric sounding), Meteorological balloons, Stratosphere, Troposphere, Statistical distributions, Stability.

The distribution of lapse rates observed with a high resolution temperature sonde on two summer balloon flights is presented. Shallow layers of relative instability are observed in the stratosphere as well as the troposphere. Ten percent of the troposphere sounding had lapse rates in excess of 9.5 deg/km. This fraction of relatively unstable lapse rates must play a large role in determining the over-all diffusivity of the stratosphere. (Author)

AD-750 469 PC$3.00/MF$0.95
Kiruna Geophysical Observatory (Sweden)
OBSERVATIONS OF BEACON TRANSMISSIONS FROM SATELLITES INTELSAT 2F-1 AND 2F-2.
Summary scientific rept. 1 Apr-30 Jun 72,
Ludwik Liszka. 4 Aug 72, 40p AFCRL-72-0532
Contract F61052-67-C-0026

Descriptors: (*Ionosphere, Atmospheric sounding), Ionospheric disturbances, Magnetic storms, Electron density, Scientific satellites, Radio transmission, Ionospheric propagation, Sweden.
Identifiers: Intelsat 2F-1 satellite, Intelsat 2F-2 satellite.

Beacon transmissions from the semi-geostationary satellite Intelsat 2F-1 and the geostationary satellite Intelsat 2F-2 are used for studies of the high latitude ionosphere. Summer-daytime latitudinal variations of the electron content, geomagnetic storm effects and unusual propagation effects in the subauroral zone ionosphere are studied. (Author)

AD-750 474 PC$3.00/MF$0.95
Air Force Cambridge Research Labs L G Hanscom Field Mass
THE TIME DEPENDENCE OF THE TRAPPED PROTON ENERGY SPECTRUM AT LOW ALTITUDES.
Physical sciences research papers,
Zachary O'Friel, and Robert C. Filz. 15 Jun 72, 16p Rept nos. AFCRL-72-0397, AFCRL-PSRP-498

Descriptors: (*Van Allen radiation belt, Protons), Scientific satellites, Polar orbit trajectories, Power spectra, Electron density, Nuclear explosions.
Identifiers: Starfish shot.

The authors measure the energy spectra of high energy trapped protons utilizing nuclear emulsions exposed on low altitude polar orbiting satellites. The spectra are compared with those obtained by Heckman and Nakano (1969) at solar minimum and the effects of solar cycle atmospheric density changes are evaluated. (Author)

AD-750 483 PC$3.00/MF$0.95
Mount Auburn Research Associates Inc Newton Upper Falls Mass
COMPUTATION OF ION COLLECTION BY A LARGE ROCKET-MOUNTED MASS-SPECTROMETER PLATE AT A LARGE DRAWING-IN POTENTIAL.
Final rept. 28 Apr 71-30 Jun 72,
Lee W. Parker. 30 Sep 72, 49p AFCRL-72-0524
Contract F19628-71-C-0200

Descriptors: (*Atmospheric sounding, *Mass spectroscopy), (*Ionosphere, Atmospheric sounding), Ions, Collecting methods, Potential energy, Mathematical models, Probes (Electromagnetic).

Calculations of the ion current density at the central point of a charged mass-spectrometer plate mounted on a rocket were extended into the

regime of very small Debye lengths. Since self-consistent solutions are numerically difficult to obtain in this regime (especially for large dimensionless drawing-in potentials), the investigation was carried out with the aid of a linearized-space-charge model. Use of the model provides a potential distribution characterized by a Debye-length-like parameter lambda (H). The nature of the ion trajectories in the strong electric field is studied, and correlations between lambda (H) and the true Debye length are discussed. (Author)

AD-750 514 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
SOME RESULTS FROM EXPERIMENTAL INVESTIGATIONS OF TURBULENCE IN THE TROPOSPHERE AND STRATOSPHERE,
N. Z. Pinus, and G. N. Shur. 1 Sep 72, 20p Rept no. FTD-HC-23-0538-72
Unedited rough draft trans. from Beitraege zur Geophysik (East Germany) v79 n5 p363-378 1970.

Descriptors: (*Atmospheric motion, Turbulence), (*Clear air turbulence, Predictions), Troposphere, Stratosphere, Weather forecasting, Wind, Statistical analysis, East Germany.
Identifiers: Translations.

After introductory comments on the significance of turbulence research in terms of modern aviation, the authors investigate the character of turbulence on the scales concerned here. The sources and depressions of turbulent energy as well as the forms of energy spectra are discussed here in connection with various atmospheric conditions. On the basis of aircraft observations, data is presented on the appearance and character of turbulence in the stratosphere and on the level of the tropopause. Finally, the results are given for a statistical investigation of the tie-in between turbulence and macrosynoptic processes, from which a synoptic-statistical method for the prediction of clear-air turbulence is derived. (Author)

AD-750 570 PC$3.00/MF$0.95
Pennsylvania State Univ University Park Ionosphere Research Lab
AN INVESTIGATION OF D-REGION IONIZATION DURING A POLAR CAP ABSORPTION EVENT II.
Final rept.,
Leslie C. Hale. Aug 72, 30p Rept no. PSU-IRL-FR1 BRL-CR-74
Contract DAAD05-69-C-0336

Descriptors: (*Ionospheric disturbances, Ionization), Atmospheric sounding, Transmitter-receivers, Langmuir probes, Charged particles, Electron density, Polar regions.
Identifiers: *Polar cap absorption, D region.

Data is presented for parachute-borne blunt probe, charged particle, conductivity measurements during a PCA, covering a night-sunrise-day sequence of four shots on November 3, 1969 at Ft. Churchill, Manitoba. The measured conductivities show that the effects of the PCA on ionization persists down to about 30 km. A description of the propagation experiment flown with the blunt probe is presented. (Author)

AD-750 609 PC$3.00/MF$0.95
Army Electronics Command Fort Belvoir Va Night Vision Lab
NIGHT-SKY RADIANT STERANCE FROM 450 TO 2000 NANOMETERS.
Research and development technical rept.,
Mishri L. Vatsia, U. Karl Stich, and Douglas Dunlap. Sep 72, 41p ECOM-7022

Descriptors: (*Night sky, *Airglow), Spectra (Infrared), Spectra (Visible + ultraviolet), Atoms, Oxygen, Moon, Canada, Panama.
Identifiers: Oxygen atoms, Hydroxyl radical.

A ground-based, 3-channel Fourier spectroradiometer with a wave-numer resolution of 250/cm was used to measure night-sky spectral radiant sterance (radiance) in the 450-nm to 2000-nm wavelength region. The experimental sites were remote locations in Panama, United States, and Canada. Details of night-sky radiation measuring system, calibration equipment, and procedures for data acquisition and analysis are presented. A large number of night-sky radiant sterance spectra recorded under various types of nighttime meteorological environments and moon phases are presented. The results are compared to measurements reported in the literature. The night-sky radiant sterance spectra presented in this work are unique in two respects: They cover the wide wavelength region from 450 nm to 2000 nm; and They were recorded under a large variety of nighttime, atmospheric, optical environments. (Author)

AD-750 610 PC$3.00/MF$0.95
Army Electronics Command Fort Belvoir Va Night Vision Lab
ATMOSPHERIC OPTICAL ENVIRONMENT.
Research and development technical rept.,
Mishri L. Vatsia. Sep 72, 123p* ECOM-7023
Contract DA-1-S-662709-D-617

Descriptors: (*Atmosphere, Optical properties), Sky brightness, Solar radiation, Night sky, Twilight, Absorption spectrum, Attenuation, Scattering, Visibility.
Identifiers: Atmospheric radiation, Atmospheric attenuation, Atmospheric scattering, Moonlight.

A knowledge of the fundamental optical properties of the terrestrial atmospheric environment is essential for solving various problems in the multidisciplinary field of Visionics including the areas of vision, psychology, atmospheric physics, infrared physics, simulation, astrogeophysics, and electro-optical technology. The aim of the report is to generalize the recent work of the author and summarize the data from other worldwide sources published by the first quarter of the year 1972. The report included a treatment of the atmospheric radiation, the atmospheric transmission, and the transfer of contrast by the atmosphere. The fundamental characteristics of the daytime and nighttime radiation including some important recent measurements of the solar, twilight, and nightglow radiation spectra are presented. An extensive chapter on atmospheric transmission includes the fundamental properties of the terrestrial atmosphere and basic principles of atmospheric absorption and scattering. A fairly complete collection of the most important data on atmospheric transmittance in the 0.4 micrometer to 15 micrometers spectral region is presented. The effects of atmospheric turbulence on the propagation of imagery are described. A detailed analysis of the transfer of contrast by the atmosphere is presented, and its significance on the performance of electro-optical devices is emphasized. (Author)

AD-750 661 PC$3.00/MF$0.95
Cornell Univ Ithaca N Y Lab of Plasma Studies
SOME NON-LINEAR ASPECTS OF STRIATION GROWTH IN BARIUM CLOUDS.
Topical research rept.,
Isaish Nebenzahl. Sep 71, 38p Rept no. LPS-79
Contract N00014-67-A-0077-0002

Descriptors: (*Atmospheric sounding, Atmospheric motion), Barium, Magnetic fields, Stability, Equations of motion, Fourier analysis.
Identifiers: *Chemical release studies, *Barium clouds.

The dynamics of barium clouds, as formulated by Longmire, is analysed for stability. Equations are derived for the behavior of perturbations both in the linear and non-linear regimes. The main result for the linear regime is that for the fastest growing unstable mode, k bisects the angle between the density gradient and the neutral wind. The main results of the non-linear analysis are discussed.

AD-750 741 PC$3.00/MF$0.95
Aerospace Corp El Segundo Calif Lab Operations
DRIFT-SHELL SPLITTING BY INTERNAL GEOMAGNETIC MULTIPOLES.
Rept. for Jan-May 72,
Henry H. Hilton, Michael Schulz, and Juan G. Roederer. 25 Sep 72, 42p Rept no. TR-0073 (3260-20)-4 SAMSO-TR-72-234
Contract F04701-72-C-0073

Descriptors: (*Magnetosphere, Particle trajectories), Terrestrial magnetism, Charged particles, Diffusion.

Computations on an 80-coefficient model of the earth's field illustrate the 'topography' of the magnetic equatorial surface (on which (B dot del B = O) and the geometry of the drift shells of geomagnetically trapped particles. Individual terms in the spherical-harmonic expansion (offset-dipole coordinates) of the geomagnetic scalar potential V (r, theta, phi) are either even or odd in cos theta, where theta = pi/2 denotes the dipole equator. Terms that (unlike the dipole) are even in cos theta tend to 'warp' the equatorial surface, but do not (in first order) distort particle drift shells radially nor split the drift shells of particles having different equatorial pitch angles. Azimuthally asymmetric terms that are odd in cos theta do cause shell splitting in first order. Shell splitting at large L values (neglecting deformation of the earth's field by the solar wind) is found to be dominated by the geomagnetic octupole. At L about = 1, shell splitting is strongly enhanced by the South American and South African anomalies. When combined with pitch-angle diffusion caused by atmospheric scattering, these results may be able to account for anomalous radial diffusion of inner-zone electrons. (Author)

AD-750 794 PC$3.00/MF$0.95
Avco Everett Research Lab Everett Mass
VOIGT PROFILES FOR THE BARIUM ION RESONANCE LINE AT 4934A.
Research note,
E. R. Bressel, and B. Kivel. Feb 69, 30p Rept no. AERL-RN-808 RADC-TR-69-84
Contract F30602-69-C-0036, ARPA Order-1225
Report on Project SECEDE. See also AD-750 795.

Descriptors: (*Barium, *Spectra (Visible + ultraviolet)), (*Atmospheric sounding, Barium), Ions, Hyperfine structure, Isotopes, Differential cross section, Absorption spectrum.
Identifiers: SECEDE Project, Barium clouds, *Chemical release studies, Absorptivity.

Chemical releases in the upper atmosphere have become more quantitative with the use of barium which is ionized by solar irradiation. Optical measurements give the cloud size and motion. Attempts to use the hyperfine components of the odd mass isotopes is being pursued, since these components become optically thin sooner and closer to the release center than the unsplit line of the more abundant even mass isotopes. In this note, the authors provide the absorption cross section for the barium ion resonance line at 4934A which is of use in estimating the line density of Ba ions when the hyperfine components are optically thin. (Author)

AD-750 795 PC$3.00/MF$0.95
Avco Everett Research Lab Everett Mass
STRUCTURE OF SPECTRAL LINES OF BA I AND BA II.
Research note,
B. Kivel, and M. B. Saxe. Feb 69, 29p Rept no. AERL-RN-811 RADC-TR-69-85
Contract F30602-69-C-0036, ARPA Order-1225
Report on Project SECEDE. See also AD-750 794.

Descriptors: (*Barium, *Spectra (Visible + ultraviolet)), (*Atmospheric sounding, Barium), Ions, Hyperfine structure, Line spectrum, Absorption spectrum, Differential cross section.
Identifiers: SECEDE Project, Barium clouds, *Chemical release studies, Absorptivity.

Additional line profiles have been calculated for barium ions. Profiles have been calculated for T=300, 1000, and 3000K. The lines computed are for Ba I at 5535A and Ba II at 4554, 5854, 6142, and 6497A. (Author)

AD-750 860 PC$3.00/MF$0.95
Aerospace Corp El Segundo Calif Lab Operations
APPROXIMATE SECOND INVARIANT FOR A DIPOLE FIELD.
Research rept. Oct-Nov 70,
Michael Schulz. 15 Sep 72, 20p Rept no. TR-0073 (3260-20)-2 SAMSO-TR-72-233
Contract F04701-72-C-0073

Descriptors: (*Magnetosphere, Particle trajectories), Dipole moments, Differential equations, Approximation (Mathematics), Invariance, Terrestrial magnetism, Charged particles.
Identifiers: *Magnetic dipoles.

Mathematically self-consistent analytical approximations to the second invariant and drift frequency in terms of pitch angle and energy are deduced from an existing analytical approximation to the bounce period of a charged particle trapped in the field of a magnetic dipole. The numerical accuracy of the resulting expressions is significantly better than that of the approximations to these functions customarily found in the literature. The results are potentially of interest in simplifying the theories of bimodal diffusion and other dynamical phenomena in the magnetosphere. (Author)

AD-750 861 PC$3.00/MF$0.95
Aerospace Corp El Segundo Calif Lab Operations
RADIAL DIFFUSION OF IONIZED HELIUM AND PROTONS: A PROBE FOR MAGNETOSPHERIC DYNAMICS.
Research rept. Jun 70-Jan 72,
John M. Cornwall. 15 Sep 72, 56p Rept no. TR-0073 (3260-20)-1 SAMSO-TR-72-238
Contract F04701-72-C-0073

Descriptors: (*Magnetosphere, Particle trajectories), Solar wind, Helium, Ions, Protons, Alpha particles, Diffusion, Electrostatic fields.

The comparison of radial diffusion of magnetospheric helium ions and protons is a sensitive test of the diffusion process assumed (magnetic or electrostatic fluctuations) and thus valuable as a probe of magnetospheric dynamics for protons, electrons, and heavy ions, as well as for the helium ions themselves. In the paper, radial profiles of ionized helium flux and protons were calculated, taking into account certain physical effects ignored in previous treatments. These include: (1) charge exchange processes (He (++) yields He (+) yields He or He (++)) which provide a loss mechanism as well as a way of converting solar wind alpha particles to He (+); (2) contribution of fluctuating electrostatic fields to the radial diffusion coefficient. (Author)

AD-750 865 PC$3.00/MF$0.95
Aerospace Corp El Segundo Calif Lab Operations
INTRINSIC BANDWIDTH OF CYCLOTRON RESONANCE IN THE GEOMAGNETIC FIELD.
Technical rept. Nov 71-Apr 72,
M. Schulz. 15 Sep 72, 15p Rept no. TR-0073 (3260-20)-3 SAMSO-TR-72-235
Contract F04701-72-C-0073

Descriptors: (*Magnetosphere, Cyclotron resonance phenomena), Terrestrial magnetism, Plasma oscillations, Particle trajectories, Very low frequency.
Identifiers: Geomagnetism.

Equatorial resonance between electrons and VLF signals is characterized by an intrinsic bandwidth approximately 20 Hz at L = 3, owing to the inhomogeneity of B. The corresponding interaction time (approximately 50 msec) approximates the length of a Morse dot. (Author)

AD-750 870 PC$3.00/MF$0.95
Naval Intelligence Support Center Washington D C Translation Services Div
DIURNAL VARIATION OF COSMIC RAYS IN 1962 AND IN 1964-1965 (SUTOCHNAYA VARIATSIYA KOSMICHESKIKH LUCHEI V 1962 I 1964-1965 GODAKH),
A. K. Pankratov. 29 Sep 72, 15p Rept no. NISC-Trans-3349
Trans. of Akademiya Nauk SSSR. Krymskaya Astrofizicheskaya Observatoriya. Izvestiya, v41/42 p230-239 1970.

Descriptors: (*Cosmic rays, Diurnal variations), Sunspots, Neutrons, Anisotropy, Distribution functions, USSR.
Identifiers: Translations.

The diurnal variation amplitude and phase data both of the cosmic-ray neutron component for the periods of August-December 1962, 1964-1965 and the hard component for the period of January 1964-April 1965 were obtained. The qualitative analysis of these data as well as the same data for the period of the IGY and underground measurement data shows that during the minimum sunspot activity the significant changes of the configuration of cosmic-ray modulation region take place in the direction of high helio-latitudes. (Author)

AD-750 876 PC$3.00/MF$0.95
Air Force Cambridge Research Labs L G Hanscom Field Mass
BIBLIOGRAPHY, WITH ABSTRACTS, OF AFCRL PUBLICATIONS FROM 1 APRIL TO 30 JUNE 1972.
Special repts.
1 Aug 72, 189p Rept nos. AFCRL-72-0433, AFCRL-SR-142
See also report dated 1 Apr 72, AD-745 168.

Descriptors: (*Air force research, *Bibliographies), Abstracts, Atmospheric sounding, Atmospheric sounding, Ionospheric disturbances, Solar disturbances, Solid state physics, Geophysics, Plasma physics, Seismology, Lasers, Astrophysics.

The bibliography lists all AFCRL in-house reports, journal articles, and contractor reports issued from 1 April to 30 June 1972. Abstracts are included. (Author)

AD-750 878 PC$3.00/MF$0.95
Wayne State Univ Detroit Mich Research Inst for Engineering Sciences
STUDIES OF ATMOSPHERIC PROCESSES.
Semi-annual technical rept. no. 2,
Frederick P. Boynton, Edward R. Fisher, Ralph H. Kummler, and Pieter K. Rol. 15 Jun 72, 30p
AFCRL-72-0453
Contract F19628-72-C-0007, ARPA Order-1856
See also report dated 15 Dec 71, AD-744 081.

Descriptors: (*Upper atmosphere, *Exhaust gases), Nonequilibrium flow, Chemical reactions, Chemiluminescence, Reaction kinetics, Hydrocarbons, Oxygen, Atoms, Ethylenes, Differential cross section, Excitation, Vibration.
Identifiers: Missile plumes, *Rocket exhaust, Oxygen atoms, Rarefied gas dynamics, Collision cross sections.

The research described in this report is aimed at characterizing the non-equilibrium flow and coupled chemistry associated with the interaction of rocket exhaust effluents in the upper atmosphere. Infrared chemiluminescence emitted from the reaction between 0 and C2H4 has been quantitatively measured under lean conditions. The ratio of the rate coefficients for the reactions CHO + O to CO + OH* and CHO + O2 to CO + HO2 was found. The rate coefficient for the reaction CH2O + 0 to CHO + OH was also determined. A compilation of all available cross section information is included herein for use in highly rarefied plume calculations. The molecular beam measurements on the interaction potential between O atoms and plume species is described. (Author)

AD-750 945 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE PROBLEM OF THE ANGULAR DISTRIBUTION OF ASCENDING LONG-WAVE RADIATION,
E. P. Barashkova, L. I. Prokoveva, and G. P. Sidorenko. 17 Aug 72, 20p Rept no. FTD-MT-24-284-72
Edited machine trans. from Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n235 p155-165 1970, by R. J. Zeccola.

Descriptors: (*Atmosphere, Infrared radiation), Atmospheric temperature, Thermal radiation, Intensity, Distribution functions, USSR.
Identifiers: Translations, Far infrared radiation, Intermediate infrared radiation, Angular distribution.

Measurements were carried out, from on board an aircraft, of the brightness of ascending long-wave radiation in the 3-30 micrometer waveband at different angles alpha over different types of underlying surface. A clear dependence was found in the nature of the angular distribution of this radiation on atmospheric stratification. Changes in the water-vapor content were not observed to play an appreciable role in the mechanism involved, with the angular distribution of the ascending long-wave radiation at different levels of the troposphere basically determined by the vertical temperature profile. (Author)

AD-750 962 PC$3.75/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
AN EXPERIMENT IN THE SIMULTANEOUS INVESTIGATIONS OF THE THREE-DIMENSIONAL STRUCTURE OF A RADIATION FIELD IN THE ATMOSPHERE USING EQUIPMENT INSTALLED ON AIRPLANES, BALLOONS, AND SATELLITES,
E. P. Barashkova, V. L. Gaevskii, K. Ya. Kondratev, and G. A. Nikolskii. 15 Aug 72, 31p
Rept no. FTD-HT-23-257-72
Edited trans. of Issledovanie Radiatsionnykh Protsessov v Atmosfere i Voprosy Sputnikovoi Meteorologii. Trudy (USSR) n235 p7-23 1970, by Bernard L. Tauber.

Descriptors: (*Atmosphere models, Thermal radiation), Atmospheric temperature, Atmospheric sounding, Boundary layer, Terrain, USSR.
Identifiers: Translations, Terrestrial radiation, Remote sensing.

An experiment in simultaneous investigations of the three-dimensional structure of a radiation field in the atmosphere using equipment installed on the ground (actinometric net), an airplane, balloon, and satellite is presented. The experiment was conducted on 27 June 1967 using Cosmos-156, an airplane at an altitude of 8.4 km, and a balloon at an altitude of 30 km. Instruments were a pyranometer and scanning and wide-angle actinometric equipment. Results are discussed.

AD-751 005 Reprint
Stanford Univ Calif Inst for Plasma Research
QUASI-LINEAR INTERACTION OF WHISTLER-MODE WAVES AND NONTHERMAL ELECTRONS,
P. C. W. Fung. 10 Jan 72, 25p
Contract N00014-67-A-0112-0062
Supersedes report dated Nov 71, AD-734 435.
Availability: Pub. in Astrophysics and Space Science, v16 p249-273 1972.

Descriptors: (*Magnetosphere, *Whistlers), Cyclotron resonance phenomena, Terrestrial magnetism, Doppler effect, Very low frequency, Ionospheric propagation, Electrons, Distribution functions, Partial differential equations, Turbulence, Graphics, Curve fitting, Wave functions.

In the paper the author attempt to analyze the quasi-linear cyclotron instability (under the weak

turbulence regime) for whistler-mode waves due to pitch angle anisotropy of nonthermal electrons. The motivation of the study is to explain the triggered discrete VLF emissions occurring in the terrestrial magnetosphere. The time evolution of the growth rate and the induced waves spectrum for a loss cone type of nonthermal electrons is analyzed numerically. The diffusion of particles in pitch angles due to quasilinear cyclotron instability is illustrated. It is shown that several major features of triggered VLF emissions can be explained by the stated instability. Some predictions of the theory is given and suggestions for further research are presented. (Author)

COM-72-11319 Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Environmental Research Labs.
ATMOSPHERIC ELECTRIC CLOUD MODELLING,
L. H. Ruhnke. 1972, 6p NOAA-72082121
Summary in German.
Pub. in Meteorologische Rundschau (Germany) v25 n2 p38-41 1972.

Descriptors: (*Atmospheric electricity, Mathematical models), Electric charge, Electric fields, Convection, Conductivity.

Numerical methods are used to calculate electric charges and electric fields in an atmosphere where data on convection and conductivity are available in parameter form. The influence of updraft on the charge and field distribution in fair weather and in the presence of nonraining clouds is shown in examples. It is concluded that no strong generation of electricity is likely in the atmosphere by convective mechanisms and inhomogenities of conductivity alone. (Author)

COM-72-11323 Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Environmental Research Labs.
THE CYLINDRICAL FIELD MILL.
H. W. Kasemir. 1972, 7p NOAA-72082122
Summary in German.
Pub. in Meteorologische Rundschau (Germany), v25 n2 p33-38 1972.

Descriptors: (*Atmospheric electricity, Measuring instruments), Meteorological instruments, Calibration, Electric charge, Electric fields.
Identifiers: *Field mill system, Cylindrical field mill.

The report describes the cylindrical field mill which is especially suited to recording the atmospheric electric field from an airplane. Each cylindrical field mill delivers two components of the electric field so that only two such instruments are required to obtain all three components of the atmospheric electric field. Correct places for mounting the field mills on the plane and the determination of the calibration factor are discussed. A brief analysis of the field records is given for the simple case of an electric charge of one sign in different positions to the airplane path. (Author)

N72-28322 PC$4.25/MF$0.95
California Inst. of Tech., Pasadena.
HIGH ENERGY ELECTRON SPIKES AT HIGH LATITUDES.
J. W. Brown, and E. C. Stone. Jan 72, 41p
NASA-CR-122512, SRL-72-1
Contracts NAS5-3095, NGL-05-002-007
Subm- Sponsored in Part By Nsf

Descriptors: *Electron precipitation, *Ogo-d, High energy interections, Trapped particles.

For abstract, see STAR 10 19.

N72-28323 PC$3.75/MF$0.95
Pittsburgh Univ., Pa. Dept. of Chemistry.
KINETICS AND MECHANISM OF THE FORMATION OF WATER CLUSTER IONS FROM O2 (PLUS) AND H2O IN HE, AR, N2, AND O2 AT 296 K.
Ph.D. Thesis
C. J. Howard, V. M. Bierbaum, H. W. Rundle, and F. Kaufman. May 72, 32p NASA-CR-127448, SRCC-172
Contracts NGR-39-011-002, DA-31-124-ARO (D)-440
Subm- Sponsored in Part By Nsf

Descriptors: *D region, *Ionospheric composition, *Oxygen, *Reaction kinetics, *Water, Afterglows, Argon, Chemical reactions, Helium, Molecular ions, Nitrogen.

For abstract, see STAR 10 19.

N72-28331 PC$6.00/MF$0.95
National Physical Lab., New Delhi (India). Radio Science Div.
IONOSPHERIC DATA, OCTOBER 1970.
Oct 70, 79p RTRC-A185

Descriptors: *Critical frequencies, *E region, *F region, *Ionospheric propagation, Diurnal variations, India, Tables (data).

For abstract, see STAR 10 19.

N72-28332 PC$3.00/MF$0.95
Maryland Univ., College Park. Inst. for Fluid Dynamics and Applied Mathematics.
SM91 OBSERVATIONS OF INTERCHANGE BETWEEN ACCELERATION AND THERMALIZATION PROCESSES IN AURORAL ELECTRONS.
M. Pongratz. Apr 72, 14p NASA-CR-127560
Contracts NSR-21-002-077, NGR-21-002-008
Conf- Presented At 53d Ann. Agu Meeting, Washington, 20 Apr. 1972

Descriptors: *Acceleration (physics), *Auroras, *Electrons, *Thermalization (energy absorption), Pitch (inclination), Rocket sounding.

For abstract, see STAR 10 19.

N72-28337 PC$3.00/MF$0.95
National Physical Lab., New Delhi (India). Radio Propagation Unit.
IONOSPHERIC PREDICTIONS FOR AUGUST 1972.
Mar 72, 4p RRC-B191

Descriptors: *Critical frequencies, *F 2 region, *Ionospheric propagation, *Maximum usable frequency, India, Meteorological parameters, Nomographs.

For abstract, see STAR 10 19.

N72-28338 PC$3.00/MF$0.95
National Physical Lab., New Delhi (India).
IONOSPHERIC PREDICTIONS JULY 1972.
Mar 72, 4p RRC-B190

Descriptors: *Critical frequencies, *F 2 region, *Ionospheric propagation, *Maximum usable frequency, *Meteorological parameters, India, Nomographs.

For abstract, see STAR 10 19.

N72-28339 PC$6.00/MF$0.95
Ludwig-maximilians-universitat, Munich (West Germany). Meteorologisches Inst.
SPECTRAL RADIOMETER WITH HIGH SPATIAL RESOLUTION FOR INDIRECT SOUNDINGS OF THE ATMOSPHERE.
H. Bolle. Apr 72, 77p BMBW-FB-W-72-09
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Balloon sounding, *Meteorological balloons, *Radiometers, *Thermal radiation, Atmospheric radiation, Cassegrain optics, High resolution, Radiation measuring instruments.

For abstract, see STAR 10 19.

N72-28353 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
OGO-4 OBSERVATIONS OF THE 6300 A NIGHT AIRGLOW FROM 40 DEG N TO 40 DEG S A SET OF 19 COLOR MAPS.
E. I. Reed, and J. E. Blamont. May 72, 27p
NASA-TM-X-65954, X-625-72-173
Misc- Original Contains Color Illustrations

Descriptors: *Airglow, *Ogo-d, *Oxygen, Mapping.

For abstract, see STAR 10 19.

N72-28354 PC$8.50/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
RESULTS OF THE BALLOON ATMOSPHERIC PROPAGATION EXPERIMENT FLIGHTS OF 1970 (BAPE 1).
P. O. Minott, J. L. Bufton, and M. W. Fitzmaurice. Mar 72, 130p NASA-TM-X-65952, X-524-72-125

Descriptors: *Atmospheric turbulence, *Gas lasers, *Scintillation, Statistical analysis.

For abstract, see STAR 10 19.

N72-28357 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THEORETICAL MODEL FOR THE LATITUDE DEPENDENCE OF THE THERMOSPHERIC ANNUAL AND SEMIANNUAL VARIATIONS.
H. G. Mayr, and H. Volland. Jun 72, 29p
NASA-TM-X-65961, X-621-72-235
Subm- Submitted for Publication

Descriptors: *Atmospheric models, *Periodic variations, *Thermosphere, Atmospheric circulation, Atmospheric composition, Atmospheric temperature, Energy transfer, Mass transfer.

For abstract, see STAR 10 19.

N72-28358 PC$4.50/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A NUMERICAL STUDY OF A THREE DIMENSIONAL SPHERICAL THERMOSPHERIC DENSITY AND WIND MODEL.
H. Volland, and H. G. Mayr. Jun 72, 47p
NASA-TM-X-65960, X-621-72-234
Subm- Submitted for Publication

Descriptors: *Atmospheric density, *Atmospheric models, *Atmospheric tides, *Thermosphere, Conductive heat transfer, E region, F region, Perturbation theory, Winds aloft.

For abstract, see STAR 10 19.

N72-28359 PC$3.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A TWO COMPONENT MODEL OF THE DIURNAL VARIATIONS IN THE THERMOSPHERIC COMPOSITION.
H. G. Mayr, and H. Volland. Jun 72, 23p
NASA-TM-X-65959, X-621-72-233
Subm- Submitted for Publication

Descriptors: *Atmospheric diffusion, *Thermosphere, Atmospheric density, Atmospheric temperature, Electron density (concentration), Gaseous diffusion, Wind (meteorology).

For abstract, see STAR 10 19.

N72-28361 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PARTICLE AND FIELD OBSERVATIONS FROM EXPLORER 45 DURING THE DECEMBER 1971 MAGNETIC STORM PERIOD.
R. A. Hoffman. Jul 72, 17p NASA-TM-X-65963, X-646-72-242
Subm- Submitted for Publication

Descriptors: *Magnetic signatures, *Protons, *Ring currents, Explorer satellites, Magnetic storms.

For abstract, see STAR 10 19.

N72-28362 PC$6.25/MF$0.95
Finnish Meteorological Inst., Helsinki.
MEASUREMENTS OF RADIATION AND BRIGHT SUNSHINE 1969-1970.
1972, 85p
LANG- IN ENGLISH AND FINNISH

Descriptors: *Finland, *Solar radiation, *Sunlight, Measuring instruments, Tables (data).

For abstract, see STAR 10 19.

N72-28370 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
RING CURRENT PARTICLE DISTRIBUTIONS DURING THE MAGNETIC STORMS OF 16-18 DECEMBER 1971.
P. H. Smith, and R. A. Hoffman. Jul 72, 19p
NASA-TM-X-65962, X-646-72-241
Subm- Submitted for Publication

Descriptors: *Energy distribution, *Explorer satellites, *Magnetic storms, *Proton energy, Flux density, High energy interactions.

For abstract, see STAR 10 19.

N72-28375 PC$3.00/MF$0.95
Department of Energy, Mines and Resources, Ottawa (Ontario).
POLAR MAGNETIC SUBSTORMS 03 - 06, UT, 5 DECEMBER 1968.
Publications of the Earth Physics Branch, Volume 42, No. 4
E. I. Loomer, and G. Jansenvanbeek. 1972, 12p

Descriptors: *Auroral electrojets, *Magnetic effects, *Polar substorms, Atmospheric circulation, Magnetic disturbances.

For abstract, see STAR 10 19.

N72-28398 PC$3.50/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
GEOPHYSICAL OBSERVATIONS . OBSERVATIONS GEOPHYSIQUES BULLETIN MENSUEL, JUIN 1971.
Monthly Bulletin, Jun. 1971
Jun 71, 27p
LANG- IN FRENCH AND DUTCH

Descriptors: *Atmospheric electricity, *Belgium, *Cosmic rays, *Geomagnetism, *Ionospheric propagation, *Seismology, Beta particles, Geophysical observatories, Tables (data).

For abstract, see STAR 10 19.

N72-28586 PC$3.00/MF$0.95
Max-planck-institut Fuer Physik Und Astrophysik, Munich (West Germany).
NUMERICAL ANALYSIS OF COMET MODELS . NUMERISCHE BEHANDLUNG EINES KOMETENMODELLS.
B. Brosowski, and R. Wegmann. Apr 72, 20p
MPI/PAE-ASTRO-46

Descriptors: *Comets, *Cosmic plasma, *Iterative solution, Hydrodynamic equations, Interplanetary gas, Plasma-particle interactions.

For abstract, see STAR 10 19.

N72-28648 PC$7.50/MF$0.95
Istituto Di Fisica Dell Atmosfera, Rome (Italy).
REPORT ON THE ORGANIZATIONAL, SCIENTIFIC AND EDUCATIONAL ACTIVITIES OF THE ISTITUTO DI FISICA DELL ATMOSFERA FOR THE FISCAL YEAR 1971 . RELAZIONE SULLATTIVITA ORGANIZZATIVA SCIENTIFICA E DIDATTICA DELLISTITUTO DIFISICA DELLATMOSFERA NELLESERCIZIO FINANZARIO 1971.
Feb 72, 107p IFA-TR-40

Descriptors: *Atmospheric physics, *Meteorological parameters, *Research projects, Aeronomy, Air pollution, Climatology, Education, Magnetosphere, Meteorology, Radar scanning, Radioactivity, Statistical analysis.

For abstract, see STAR 10 19.

N72-28802 PC$4.50/MF$0.95
Mcdonnell-douglas Astronautics Co., Huntington Beach, Calif. Space Sciences Dept.
ANALYSIS OF INNER AND OUTER ZONE OGO-1 AND OGO-2 ELECTRON SPECTROMETER AND ION CHAMBER DATA.
Final Report
K. A. Pfitzer. 12 May 72, 46p NASA-CR-127455, MDC-G2960
Contract NASW-2203

Descriptors: *Electrons, *Ionization chambers, *Ogo-a, *Ogo-b, *Radiation belts, *Spectrometers, Geomagnetism, Solar wind, Trapped particles.

For abstract, see STAR 10 19.

N72-28806 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PROVISIONAL HOURLY VALUES OF EQUATORIAL DST FOR 1971.
M. Sugiura, and D. J. Poros. Jun 72, 17p
NASA-TM-X-65930, X-645-72-200

Descriptors: *Magnetic equator, *Magnetic storms, *Magnetic variations, *Tables (data), Geophysical observatories, Magnetic disturbances, Nonuniform magnetic fields.

For abstract, see STAR 10 19.

N72-28808 PC$3.00/MF$0.95
Techtran Corp., Glen Burnie, Md.
THE UPPER LIMIT OF BRIGHTNESS FLUCTUATIONS OF BACKGROUND RADIATION IN THE 1-5 MM REGION.
V. S. Soglasnova. Jul 72, 6p NASA-TT-F-14377, PR-87
Contract NASW-2037
Tran- Transl. Into English of Verkha. Predel Fluktuatsiy Yarkosti, Fonovogo Izlucheniya V Obl. Ot 1 Do 5 Mm, Rept Pr-87 Inst. of Space Res., Acad. Sci. USSR, Moscow, 1971 7 P

Descriptors: *Background radiation, *Brightness temperature, *Millimeter waves, Night sky, Sky radiation.

For abstract, see STAR 10 19.

N72-28892 PC$8.00/MF$0.95
Germantown Labs., Inc., Philadelphia, Pa.
DESIGN, TESTING, FABRICATION AND LAUNCH SUPPORT OF A LIQUID CHEMICAL BARIUM RELEASE PAYLOAD (UTILIZING THE LIQUID FLUORINE-BARIUM SALT/HYDRAZINE SYSTEM).
C. S. Stokes, E. W. Smith, and W. J. Murphy. 1972, 118p NASA-CR-112106
Contract NAS1-7709

Descriptors: *Artificial clouds, *Barium, *Flight tests, *Ionospheric sounding, Electrical properties, Magnetic properties, Magnetosphere.

For abstract, see STAR 10 19.

N72-29117 PC$3.00/MF$0.95
California Univ., Los Angeles. Plasma Physics Group.
REMOTE DOUBLE RESONANCE COUPLING OF RADAR ENERGY TO IONOSPHERIC IRREGULARITIES.
C. F. Kennel. Jan 71, 16p NASA-CR-127748, R-85
Contracts NGL-05-007-190, N00014-69-A-0200-4023

Descriptors: *Frequency modulation, *Ionospheric disturbances, *Resonance, Beams (radiation), Radar equipment.

For abstract, see STAR 10 20.

N72-29276 PC$11.75/MF$0.95
Illinois Univ., Urbana. Aeronomy Lab.
AN INVESTIGATION OF THE IONOSPHERIC D REGION AT SUNRISE.
R. P. Turco, and C. F. Sechrist, Jr. 1 Dec 70, 194p NASA-CR-127785, UILU-ENG-70-264
Contracts NGR-14-005-013, NSF GA-14232

Descriptors: *D region, *Lower ionosphere, *Sunrise, Alpha particles, Ionospheric electron density.

For abstract, see STAR 10 20.

N72-29277 PC$3.00/MF$0.95
TRW Systems Group, Redondo Beach, Calif. Space Sciences Dept.
ELECTROSTATIC INSTABILITY OF RING CURRENT PROTONS BEYOND THE PLASMAPAUSE DURING INJECTION EVENTS.
F. V. Coroniti, R. W. Fredricks, and R. White. 1 May 72, 12p NASA-CR-127756, TRW-22935-6001-R0-00
Contract NASW-2357

Descriptors: *Electrostatics, *Protons, *Ring currents, Distribution functions, Ion cyclotron radiation, Plasmapause, Stability.

For abstract, see STAR 10 20.

N72-29278 PC$4.50/MF$0.95
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
LIGHTNING SUMMARY REPORT THROUGH 1971.
18 Feb 72, 50p NASA-TM-X-68398, KSC-TR-942
Misc 0revised

Descriptors: *Florida, *Lightning, Graphs (charts), Tables (data).

For abstract, see STAR 10 20.

N72-29280 PC$7.25/MF$0.95
Stanford Univ., Calif. Radioscience Lab.
VHF/UHF TECHNIQUE FOR THE DETERMINATION OF THE COLUMNAR ELECTRON CONTENTS OF THE PLASMASPHERE AND OF THE PROTONOSPHERE USING GEOSTA-

TIONARY SATELLITE TRANSMISSION OBSERVATIONS DURING MAGNETIC STORMS.
O. G. Almeida. May 72, 101p NASA-CR-127804, TR-14
Contract NGR-05-020-001

Descriptors: *Goe satellites, *Ionospheric electron density, *Magnetic storms, Ats 3, Satellite observation.

For abstract, see STAR 10 20.

N72-29281 PC$11.50/MF$0.95
Stanford Univ., Calif. Radioscience Lab.
THE COUPLING BETWEEN THE IONOSPHERE AND THE PROTONOSPHERE AND ITS IMPLICATIONS ON THE LONG TERM VARIATIONS OF IONOSPHERIC ELECTRON CONTENT.
H. Waldman. Sep 71, 188p NASA-CR-127805, TR-13
Contract NGR-05-020-001

Descriptors: *F region, *Ionospheric electron density, Daytime, Long term effects, Simulation.

For abstract, see STAR 10 20.

N72-29282 PC$5.25/MF$0.95
Lockheed Missiles and Space Co., Palo Alto, Calif. Research Lab.
ANALYSIS OF AURORAL PARTICLE FLUXES.
Final Report
C. R. Chappell. 1 Jun 72, 63p NASA-CR-127783
Contracts NASW-2212, NSR-44-006-004

Descriptors: *Auroral ionization, *Backscattering, *Electron flux density, *Electron photon cascades, Data reduction, Ionospheric sounding, Javelin rocket vehicle.

For abstract, see STAR 10 20.

N72-29292 PC$3.00/MF$0.95
California Univ., Los Angeles. Dept. of Physics.
LOCATING THE MAGNETOSPHERIC RING CURRENT.
R. M. Thorne, and C. F. Kennel. Mar 71, 12p
NASA-CR-127769, R-88
Contracts NGL-05-007-190, N00014-69-A-0200-4023

Descriptors: *Geomagnetism, *Magnetic storms, *Ring currents, Charge exchange, Magnetically trapped particles, Solar protons.

For abstract, see STAR 10 20.

N72-29424 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A MODIFIED MONTE CARLO MODEL FOR THE IONOSPHERIC HEATING RATES.
H. G. Mayr, E. G. Fontheim, and S. C. Robertson. Jul 72, 12p NASA-TM-X-65980, X-621-72-265
Subm- Submitted for Publication

Descriptors: *Heat flux, *Ionosphere, *Monte carlo method, *Photoelectrons, Atmospheric models, Energy distribution, Nonlinear equations.

For abstract, see STAR 10 20.

N72-29425 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
BARIUM RELEASE SYSTEM.
Patent Application
B. W. Lewis, C. S. Stokes, E. W. Smith, and W. J. Murphy. 28 Apr 72, 16p
NASA-CASE-LAR-10670-2, US-PATENT-APPL-SN-248761
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Barium, *Chemical reactions, Interplanetary space, Patent applications, Upper atmosphere.

For abstract, see STAR 10 20.

N72-29427 PC$3.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AN INVESTIGATION OF GEOMETRY AND NOISE CORRECTIONS TO SAN MARCO-C NEUTRAL ATMOSPHERIC COMPOSITION EXPERIMENT DATA.
S. A. Curtis. Jul 72, 25p NASA-TM-X-65982, X-626-72-269

Descriptors: *Atmospheric composition, *Error correcting devices, *San marco satellite, *Spectrometers, Atmospheric density, Data processing, Density measurement, Signal to noise ratios.

For abstract, see STAR 10 20.

N72-29428 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
EQUATORIAL THERMOSPHERIC COMPOSITION AND ITS VARIATIONS.
G. P. Newton, D. T. Pelz, and W. T. Kasprzak. Aug 72, 10p NASA-TM-X-65981, X-621-72-266
Conf- Presented At 15th Cospar Meeting, Madrid, Spain, 22 May 1972

Descriptors: *Atmospheric composition, *Equatorial orbits, *San marco satellite, Data acquisition, Earth atmosphere, Satellite observation.

For abstract, see STAR 10 20.

N72-29429 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE EQUATORIAL AIRGLOW AND THE IONOSPHERIC GEOMAGNETIC ANOMALY.
S. Chandra, E. I. Reed, B. E. Troy, Jr., and J. E. Blamont. Aug 72, 28p NASA-TM-X-65978, X-621-72-260
Subm- Submitted for Publication

Descriptors: *Airglow, *Atmospheric chemistry, *Ogo-d, Emission, Geomagnetism.

For abstract, see STAR 10 20.

N72-29430 PC$3.75/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MAGNETIC FIELD SIGNATURES OF SUBSTORMS ON HIGH LATITUDES FIELD LINES IN THE NIGHTTIME MAGNETOSPHERE.
D. H. Fairfield. Jul 72, 32p NASA-TM-X-65974, X-692-72-243
Subm- Submitted for Publication

Descriptors: *Magnetic fields, *Magnetic storms, *Magnetospheric instability, Electric current, Perturbation.

For abstract, see STAR 10 20.

N72-29435 PC$3.50/MF$0.95
National Meteorological Center, Suitland, Md.
RESULTS OF A ROCKET-NIMBUS SOUNDER COMPARISON EXPERIMENT.
A. J. Miller, and F. G. Finger. Jun 72, 30p
NASA-CR-62081
NASA ORDER P-48606 (G)

Descriptors: *Atmospheric temperature, *Nimbus satellites, *Stratosphere, Sounding rockets, Spectrometers, Temperature measurement.

For abstract, see STAR 10 20.

N72-29437 PC$3.00/MF$0.95
Kiruna Geophysical Observatory (Sweden).
FIELD ALIGNED ELECTRON ANISOTROPIES OBSERVED BY THE ESRO 1A (AURORAE) SATELLITE.
L. Holmgren, and B. Aparicio. May 72, 16p
KGO-PREPRINT-72-302
Subm- Sponsored in Part By Swed. Nat. Sci. Res. Council, Swed. Board for Tech. Develop., and Inea

Descriptors: *Angular distribution, *Anisotropy, *Esro 1 satellite, *Satellite observation, Auroral zones, Electron diffusion, Electron precipitation, Ionospheric electron density, Lines of force.

For abstract, see STAR 10 20.

N72-29438 PC$8.25/MF$0.95
Kiruna Geophysical Observatory (Sweden).
STUDIES OF STORM EFFECTS ON THE TOTAL ELECTRON CONTENT AND OF IONOSPHERIC IRREGULARITIES BY MEANS OF IMPROVED TECHNIQUES.
S. Olsson. Apr 72, 125p KGO-725
Subm- Sponsored By Swed. Nat. Sci. Res. Council

Descriptors: *Digital techniques, *Integrated circuits, *Ionospheric electron density, *Magnetic storms, Auroral zones, Faraday effect, Intelsat satellites, Ionosondes, Magnetic variations, Polarimeters, Polarization characteristics, Satellite transmission, Signal reception.

For abstract, see STAR 10 20.

N72-29439 PC$3.50/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
GEOPHYSICAL OBSERVATIONS . OBSERVATIONS GEOPHYSIQUES BULLETIN MENSUEL, JUILLET 1971.
Monthly Bulletin, Jul. 1971
Jul 71, 28p
LANG- IN FRENCH AND DUTCH

Descriptors: *Atmospheric electricity, *Belgium, *Cosmic rays, *Geomagnetism, *Ionospheric propagation, *Seismology, Beta particles, Geophysical observatories, Tables (data).

For abstract, see STAR 10 20.

N72-29440 PC$3.25/MF$0.95
Academy of Sciences (USSR, Moscow. Inst. for Space Research.
PLASMA CHARACTERISTICS NEAR THE BOUNDARY OF THE MAGNETOSPHERE.
I. M. Podgorny, Y. V. Andrianov, and E. M. Dubinin. May 72, 24p D-130
Conf- Presented At the 15th Cospar Meeting, Madrid, 1972

Descriptors: *Bow waves, *Collisionless plasmas, *Electric fields, *Magnetic fields, *Magnetosphere, Boundaries, Shock waves, Variations.

For abstract, see STAR 10 20.

N72-29442 PC$3.75/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
IONOSPHERIC AND COSMIC RAY OBSERVATIONS . OBSERVATIONS IONOSPHERIQUES ET DU RAYONNEMENT COSMIQUE BULLETIN MENSUEL, NOVEMBRE 1971.
Monthly Bulletin, Nov. 1971
Nov 71, 31p
LANG- IN FRENCH AND DUTCH

Descriptors: *Belgium, *Cosmic rays, *Ionospheric sounding, *Neutron flux density, *Tables (data), Critical frequencies, E region, Maximum usable frequency.

For abstract, see STAR 10 20.

N72-29443 PC$3.75/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
IONOSPHERIC AND COSMIC RAY OBSERVATIONS . OBSERVATIONS IONOSPHERIQUES ET DU RAYONNEMENT COSMIQUE BULLETIN MENSUEL, DECEMBRE 1971.
Monthly Bulletin, Dec. 1971
Dec 71, 31p
LANG- IN FRENCH AND DUTCH

Descriptors: *Belgium, *Cosmic rays, *Ionospheric sounding, *Neutron flux density, Critical frequencies, E region, Maximum usable frequency, Tables (data).

For abstract, see STAR 10 20.

N72-29474 PC$12.25/MF$0.95
General Electric Co., Philadelphia, Pa. Missile and Space Div.
EXTREME ULTRAVIOLET AND X-RAY SPECTROHELIOGRAPH FOR OSO-H.
Final Report, 1968 - Sep. 1971
A. A. Sterk, F. Kieser, S. Peck, and E. Knox. 20 Jan 72, 205p NASA-CR-122502, DIN-71SD4268
Contract NAS5-11169

Descriptors: *Oso-h, *Polarimeters, *Spectroheliographs, *Ultraviolet radiation, *X rays, Calibrating, Flight tests, Solar radiation, Systems engineering.

For abstract, see STAR 10 20.

N72-29477 PC$4.00/MF$0.95
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics.
A ROCKET-BORNE INSTRUMENT FOR MEASURING ELECTRIC FIELDS IN THE AURORAL IONOSPHERE.
K. Hyyppae. May 72, 40p TRITA-EPP-72-15
Subm- Submitted for Publication Sponsored By Swed. Space Res. Comm.

Descriptors: *Auroras, *Electric fields, *Ionospheric currents, *Rocket-borne instruments, Ionosphere, Measuring instruments, Plasma diagnostics, Plasma probes, Space probes.

For abstract, see STAR 10 20.

N72-29720 PC$3.00/MF$0.95
Stanford Univ., Calif. Inst. for Plasma Research.
MODULATIONAL INSTABILITY OF WHISTLERS IN COLD PLASMAS.
A. L. Brinca. Mar 72, 20p NASA-CR-127802, SU-IPR-464
Contract NGL-05-020-176

Descriptors: *Cold plasmas, *Ion motion, *Magnetospheric instability, *Relativistic effects, *Whistlers, Cyclotron frequency, Magnetic fields, Plasma density.

For abstract, see STAR 10 20.

N72-29821 PC$5.50/MF$0.95
New Mexico Univ., Albuquerque. Dept. of Physics and Astronomy.
INFRARED STUDIES OF THE CIRCUMSOLAR AND NIGHT SKY, APRIL 1968 - 30 NOVEMBER 1971.
Final Report, 1 Apr. 1968 - 30 Nov. 1971
A. W. Peterson. Feb 72, 68p NASA-CR-127797
Contract NGR-32-004-036

Descriptors: *Infrared radiation, *Night sky, *Solar corona, *Solar radiation, Photometry, Solar eclipses, Thermal emission.

For abstract, see STAR 10 20.

N72-29822 PC$3.75/MF$0.95
California Univ., Los Angeles. Inst. of Geophysics and Planetary Physics.
A STUDY OF WAVES IN THE EARTHS BOW SHOCK.
R. E. Holzer, T. G. Northrop, J. V. Olson, and C. T. Russell. Nov 71, 31p NASA-CR-127793, PUBL-949
Contracts NAS7-100, JPL-950403

Descriptors: *Bow waves, *Perturbation theory, *Solar wind, *Upstream, Ogo-e, Polarization (waves), Shock waves, Wave propagation.

For abstract, see STAR 10 20.

N72-29851 PC$3.75/MF$0.95
Royal Inst. of Tech., Stockholm (Sweden). Div. of Plasma Physics.
SHOCK-FREE SOLUTIONS OF SOLAR WIND. COMETARY PLASMA FLOWS.
M. Wallis. 17 Nov 71, 32p TRITA-EPP-71-33
Subm- Submitted for Publication Sponsored By Uk Sci. Res. Council

Descriptors: *Comets, *Ionizing radiation, *Magnetohydrodynamic flow, *Solar wind, Critical point, Flow equations, Ion production rates, Magnetosonic resonance, Mathematical models.

For abstract, see STAR 10 20.

N72-30130 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
CHEMICAL EVOLUTION OF DENSE CLOUDS.
E. W. Chappelle, B. D. Donn, W. A. Payne, Jr., and L. J. Stief. Sep 72, 17p NASA-TM-X-66008, X-691-72-321
Subm- Submitted for Publication

Descriptors: *Chemical analysis, *Cloud cover, *Molecular structure, High temperature, Stellar evolution.

For abstract, see STAR 10 21.

N72-30316 PC$3.25/MF$0.95
Pittsburgh Univ., Pa. Space Research Coordination Center.
ANALYSIS OF OGO-6 OBSERVATIONS OF THE 0 I 5577A TROPICAL NIGHTGLOW.
R. J. Thomas, and T. M. Donahue. Apr 72, 24p NASA-CR-122456, SRCC-168
Contract NAS5-11077

Descriptors: *Atomic spectra, *F region, *Nightglow, *Oxygen atoms, *Tropical regions, Ionospheric electron density, Ogo-f, Photometers.

For abstract, see STAR 10 21.

N72-30336 PC$6.00/MF$0.95
Scripta Technica, Inc., Washington, D.C.
PROPAGATION OF VISIBLE AND INFRARED WAVES IN THE ATMOSPHERE.
V. Y. Zuyev. Jul 72, 429p NASA-TT-F-707
Contract NASW-2036
Tran- Transl. Into English of the Publ. Rasprostraneniye Vidimykh I Infrakrasnykh Voln V Atmosfere Moscow, Sov. Radio Pres), 1970

Descriptors: *Atmospheric attenuation, *Infrared radiation, *Light (visible radiation), *Wave propagation, Electromagnetic wave transmission, Meteorological parameters, Spacecraft communication.

For abstract, see STAR 10 21.

N72-30342 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
IMPROVEMENT OF SYNOPTIC SCALE MOISTURE AND WIND FIELD ANALYSES USING THE NIMBUS 4 THIR 6.7 MICRON OBSERVATIONS.
J. Steranko, L. J. Allison, and V. V. Salomonson. Apr 72, 30p NASA-TM-X-65996, X-651-72-101

Descriptors: *Absorption, *Nimbus 4 satellite, *Radiometers, *Water vapor, *Wind profiles, Atmospheric moisture, Infrared instruments, Satellite observation.

For abstract, see STAR 10 21.

N72-30343 PC$3.00/MF$0.95
Massachusetts Inst. of Tech., Cambridge.
METEOROLOGICAL AND ECOLOGICAL MONITORING OF THE STRATOSPHERE AND MESOSPHERE.
R. E. Newell, and C. R. Gray. Aug 72, 166p NASA-CR-2094, AER-12-F
Contract NAS1-9884

Descriptors: *Aerosols, *Atmospheric scattering, *Oxygen, *Ozone, *Upper atmosphere, Diurnal variations, Light (visible radiation), Remote sensors, Satellite-borne instruments, Ultraviolet radiation.

For abstract, see STAR 10 21.

N72-30347 PC$4.75/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AVERAGE DAILY VARIATIONS IN THE MAGNETIC FIELD AS OBSERVED BY ATS-5.
T. L. Skillman. Aug 72, 55p NASA-TM-X-66004, X-645-72-301

Descriptors: *Ats 5, *Magnetic fields, *Magnetic variations, *Magnetosphere, Satellite instruments, Satellite observation, Tables (data).

For abstract, see STAR 10 21.

N72-30355 PC$3.75/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
VERTICAL RESOLUTION OF TEMPERATURE PROFILES OBTAINED FROM REMOTE RADIATION MEASUREMENTS.
B. J. Conrath. Nov 71, 31p NASA-TM-X-66009, X-622-71-51

Descriptors: *Earth atmosphere, *Meteorological satellites, *Radiation measurement, *Remote sensors, *Temperature profiles, Absorption spectra, Carbon dioxide, Satellite-borne instruments, Sounding.

For abstract, see STAR 10 21.

N72-30359 PC$3.25/MF$0.95
Danish Meteorological Inst., Charlottenlund.
ELECTRIC FIELDS AND HIGH-LATITUDE ZONAL CURRENTS INDUCED BY MERGING OF FIELD LINES.
J. Wilhjelm, and E. Friis-christensen. 1972, 21p
DMI-GEOPHYS-PAPERS-R-31
Subm- Submitted for Publication

Descriptors: *Atmospheric models, *Electric fields, *Interplanetary magnetic fields, *Lines of force, *Magnetosphere, Current distribution, Cusps, Explorer 40 satellite, Injun satellites, Ionosphere, Polar regions.

For abstract, see STAR 10 21.

N72-30360 PC$10.00/MF$0.95
Danish Meteorological Inst., Charlottenlund.
THE INFLUENCE OF THE DIRECTION OF THE INTERPLANETARY MAGNETIC FIELD ON THE MORPHOLOGY OF GEOMAGNETIC VARIATIONS AT HIGH MAGNETIC LATITUDE.
E. Friis-christensen. 1971, 156p
DMI-GEOPHYS-PAPERS-R-27

Descriptors: *Diurnal variations, *Interplanetary magnetic fields, *Magnetic variations, *Polar caps, Atmospheric circulation, Atmospheric models, Greenland, Ionosphere.

For abstract, see STAR 10 21.

N72-30364 PC$3.50/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
GEOPHYSICAL OBSERVATIONS . OBSERVATIONS GEOPHYSIQUES BULLETIN MENSUEL, SEPTEMBRE 1971.
Monthly Bulletin, Sep. 1971
Sep 71, 28p
LANG- IN FRENCH AND DUTCH

Descriptors: *Atmospheric electricity, *Belgium, *Cosmic rays, *Geomagnetism, *Ionospheric propagation, *Seismology, Beta particles, Geophysical observatories, Tables (data).

For abstract, see STAR 10 21.

N72-30365 PC$3.00/MF$0.95
Academy of Sciences (USSR, Moscow. Inst. for Space Research.
ON THE DIURNAL VARIATIONS IN THE THERMOSPHERE.
M. N. Izakov, S. K. Morozov, and I. A. Yascenko. 1972, 19p D-133
Conf- Presented At the 15th Cospar Meeting, Madrid, 1972

Descriptors: *Diurnal variations, *Incoherent scattering, *Satellite drag, *Thermosphere, Atmospheric density, Atmospheric models, Atmospheric temperature, Radio scattering, Wind variations.

For abstract, see STAR 10 21.

N72-30366 PC$4.50/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
OZONE OBSERVATIONS . OBSERVATIONS DOZONE LE TRIMESTRE 1969.
Quarterly Report, 1969
1972, 47P QR-1
LANG- IN FRENCH AND DUTCH

Descriptors: *Atmospheric composition, *Ozone, Belgium, Geophysics, Meteorological charts, Spectrophotometry, Tables (data), Weather stations.

For abstract, see STAR 10 21.

N72-30367 PC$3.50/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
GEOPHYSICAL OBSERVATIONS . OBSERVATIONS GEOPHYSIQUES BULLETIN MENSUEL, OCTOBRE 1971.
Monthly Bulletin, Oct. 1971
Oct 71, 28p
LANG- IN FRENCH AND DUTCH

Descriptors: *Atmospheric electricity, *Belgium, *Cosmic rays, *Geomagnetism, *Ionospheric propagation, Beta particles, Geophysical observatories, Seismology, Tables (data).

For abstract, see STAR 10 21.

N72-30368 PC$4.75/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
OZONE OBSERVATIONS . OBSERVATIONS DOZONE 2E TRIMESTRE 1969.
Quarterly Report, 1969
1972, 51P QR-2
LANG- IN FRENCH AND DUTCH

Descriptors: *Atmospheric composition, *Regions, Belgium, Geophysics, Meteorological charts, Spectrophotometry, Tables (data), Weather stations.

For abstract, see STAR 10 21.

N72-30564 PC$4.25/MF$0.95
Istituto Di Fisica Dell Atmosfera, Rome (Italy).
MEASUREMENT OF ATMOSPHERIC CARBON DIOXIDE IN SOME ITALIAN AREAS DURING 1964, 1965, AND 1966 . CONSIDERAZIONI E RISULTATI DELLE MISURE DI CO2 ATMOSFERICO ESEGUITE IN ALCUNE LOCALITA ITALIANE NEGLI ANNI 1964, 1965 E 1966.
A. Demaio, M. Moretti, and E. Sansone. Oct 70, 42p IFA-SR-31
LANG- IN ITALIAN ENGLISH SUMMARY

Descriptors: *Carbon dioxide concentration, *Italy, Air sampling, Atmospheric composition, Atmospheric temperature, Calibrating, Infrared instruments.

For abstract, see STAR 10 21.

N72-30670 PC$3.00/MF$0.95
Academy of Sciences (USSR, Moscow. Inst. for Space Research.
NONLINEAR WAVES IN GEOMAGNETIC WAKE.
A. I. Ershkovich, A. A. Nussinov, and A. A. Chernikov. 1972, 11p PR-104

Descriptors: *Geomagnetic pulsations, *Geomagnetic tail, *Magnetohydrodynamic stability, *Plasma waves, *Turbulent wakes, Nonlinearity, Pioneer 7 space probe, Plasma cylinders, Plasma density, Satellite observation, Solar wind.

For abstract, see STAR 10 21.

N72-30790 PC$3.75/MF$0.95
Max-planck-institut Fuer Physik Und Astrophysik, Munich (West Germany).
THE PROPAGATION OF ALFVEN WAVES AND THEIR DIRECTIONAL ANISOTROPY IN THE SOLAR WIND.
H. J. Voelk, and W. Alpers. Mar 72, 33p
MPI-PAE/ESTRATERR-61

Descriptors: *Anisotropy, *Interplanetary magnetic fields, *Magnetohydrodynamic waves, *Wave propagation, Magnetic variations, Plasma radiation, Solar wind, Spiral galaxies.

For abstract, see STAR 10 21.

N72-30791 PC$3.00/MF$0.95
Max-Planck-Institut Fuer Physik und Astrophysik, Munich (West Germany).
OBSERVATION OF THE DIFFUSE COSMIC GAMMA RADIATION IN THE 30-50 MEV REGION.
Mar 72, 17p

Descriptors: *Cosmic rays.

For abstract, see STAR 10 21.

N72-30823 PC$9.50/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
POGO OBSERVATIONS OF THE EQUATORIAL ELECTROJET.
J. C. Cain, and R. E. Sweeney. Aug 72, 146p
NASA-TM-X-65995, X-645-72-299

Descriptors: *Equatorial electrojet, *Ogo-d, *Ogo-f, Magnetic anomalies, Magnetic disturbances, Magnetic measurement, Magnetosphere.

For abstract, see STAR 10 21.

PB-212 584 PC$3.00/MF$0.95
New Mexico State Univ., University Park. Water Resources Research Inst.
CLOUD CHAMBER STUDY OF WATER EVAPORATION.
Technical completion rept., (Final), William B. Good. Aug 72, 60p WRRI-RR-9 W73-00266, OWRR-A-024-NMEX (3)

Descriptors: (*Cloud physics, Evaporation), (*Water, *Evaporation), Cloud chambers, Interfacial tension, Condensation, Nucleation, Water vapor, Surface chemistry, Sodium chloride, Water pollution.

A cloud chamber system was developed to study the evaporation of water and a series of experiments were performed to demonstrate its ability to carry out such investigations. An analytic method was developed to interpret the results of the study and a relationship between evaporation resistance and water surface tension was established. The effect on evaporation of ling-chain alcohol monolayers was examined and Tetra, Hexa, and Octadecanol alcohols found to be better inhibitors than Dodecanol. Two particularly important applications of the cloud chamber system developed: the study of the effect of dissolved contaminants on evaporation resistance of water and the effect of surface barriers on the evaporation rate. (Author)

4B. Meteorology

AD-750 476 PC$3.00/MF$0.95
Air Force Cambridge Research Labs L G Hanscom Field Mass
THE APPLICATION OF THE SCALE AUTOCORRELATION COEFFICIENT TO THE DETERMINATION OF THE HARMONIC CONTENT OF PERIODIC PHENOMENA - A METEOROLOGICAL AND A GEOPHYSICAL EXAMPLE.
Environmental research papers,
V. L. Corbin, H. E. Moses, and A. F. Quesada. 10 Aug 72, 25p Rept nos. AFCRL-72-0476, AFCRL-ERP-408

Descriptors: (*Meteorological parameters, Harmonic analysis), Fourier analysis, Periodic variations, Barometric pressure, Correlation techniques, Time series analysis, Geophysics, Power spectra, White noise.
Identifiers: Autocorrelation, Fourier transformation, Signal processing, *Spectrum analysis.

In a previous work a scale autocorrelation coefficient was introduced that compares a function of time with itself when the scale of time is 'stretched. It was shown that the scale autocorrelation could be used to determine ratios of frequencies which occur in phenomena with periodicities. In the present paper the authors review the properties of the scale autocorrelation coefficient and apply it to the finding of some of the ratios of the frequencies in atmospheric pressures measured daily for 8766 days. The authors also apply it to the measurements of the International Magnetic Character Figure, C (i), which was measured daily for 27,258 days. The authors regard these applications as the first test of the utility of the scale autocorrelation coefficient. The results indicate that the scale autocorrelation coefficient may indeed prove to be a valuable supplement to the use of the usual autocorrelation coefficient and the Fourier transformation of time-dependent functions. (Author)

AD-750 496 PC$3.25/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
FOUR-LEVEL METHOD FOR PREDICTING GEOPOTENTIAL IN THE TROPOSPHERE AND LOWER STRATOSPHERE TAKING RADIATION AND TURBULENT HEAT TRANSFER INTO CONSIDERATION,
M. B. Galin, A. K. Popov, and S. I. Rudenko. 28 Jul 72, 23p Rept no. FTD-MT-24-2156-71
Edited machine trans. of Voprosy Gidrodinamicheskoi Teorii Klimata i Dolgosrochnogo Prognoza Pogody (USSR) n12 p21-34 1966, by Paul J. Reiff, Jr.

Descriptors: (*Weather forecasting, Numerical analysis), Atmosphere models, Heat transfer, Thermal radiation, Solar radiation, Meteorological charts, USSR.
Identifiers: Translations.

A four-level model of a baroclinic atmosphere is used to predict geopotential at isobaric surfaces at the 50, 150, 250, and 950 millibar levels for the Northern Hemisphere. An outline for use in making the calculations is presented, and examples of predictions for periods up to 3 days are included. (Author)

AD-750 727 PC$3.00/MF$0.95
Systems Science and Software La Jolla Calif
THE EFFECTS OF MESO-SCALE AND SMALL--SCALE INTERACTIONS ON GLOBAL CLIMATE.
Semiannual technical rept. 15 Feb-14 Aug 72.
15 Sep 72, 202p Rept no. 3SCR-72-1255
AROD-9951:4-A
Contract DAHC04-71-C-0018, ARPA Order-1752

Descriptors: (*Climatology, Atmospheric motion), (*Atmospheric motion, Mathematical models), Meteorological parameters, Wind, Turbulence, Coriolis effect, Heat transfer, Thermal radiation, Mountains, Subroutines.
Identifiers: Global climatology, HAIFA computer code, Finite difference theory, FORTRAN.

The results reported herein are the continuation of numerical studies of meso-scale phenomena related to the effects of orography on momentum and energy transfer in the atmosphere and the interaction of solar radiation with the Earth's atmosphere.

AD-750 730 PC$3.00/MF$0.95
Colorado State Univ Fort Collins Dept of Atmospheric Science
STUDIES ON NUMERICAL MODELING AND MODIFICATION OF CYCLONE SCALE PRECIPITATION.
Final rept. 21 Apr 71-31 Aug 72,
F. Baer, D. B. Rao, M. J. Fritsch, and D. Randall.
31 Aug 72, 44p AROD-9642:1-EN
Grant DA-ARO-D-31-124-71-G115

Descriptors: (*Weather forecasting, Numerical analysis), (*Atmospheric precipitation, Artificial precipitation), Wind, Mathematical models, Partial differential equations, Convection (Atmospheric), Mathematical prediction.
Identifiers: *Numerical weather forecasting, Cloud seeding.

The primary purpose of this project is to successfully predict precipitation patterns over a synoptic scale region, and using the model which performed the prediction, to introduce the properties of cloud seeding in a parametric way and thus predict the possible alterations to precipitation and its effect on the consequent flow field. Efforts described here have produced a model which will hopefully produce satisfactory precipitation. The model includes a new convective parameterization scheme, careful incorporation of latent heat, consideration of computational methodology; concurrently, initial conditions have been prepared both from real atmospheric data and a theoretical test case. (Author)

AD-750 886 Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
THE LARGE-SCALE MOVEMENT OF SAHARAN AIR OUTBREAKS OVER THE NORTHERN EQUATORIAL ATLANTIC,
Toby N. Carlson, and Joseph M. Prospero. 20 Jul 71, 15p Rept no. Contrib-1455
Contracts N00014-67-A-0201-0013, Nonr-4008 (02)
Sponsored in part by Grant NSF-GA-25916.
Availability: Pub. in Jnl. of Applied Meteorology v11 n2 p283-297 Mar 72.

Descriptors: (*Marine meteorology, *Atlantic Ocean), (*Air mass analysis, Saharan Africa), Deserts, Dust storms, Wind.

The authors attempt to show that pulses of warm, dust-laden air from the Sahara are commonly present over the northern equatorial Atlantic Ocean during the summer and early fall. These pulses appear to be generated near the African coast by an interruption in the westward transport of dusty Saharan air caused by the passage of travelling disturbances from equatorial Africa; after the distrubances have passed, the westward flow of dusty air from the interior of the Sahara is resumed. (Author)

AD-750 889 PC$3.00/MF$0.95
Weather Science Inc Norman Okla
STUDIES OF RAIN CYCLES OF WARM CUMULI,
Joe J. Sutherland, and D. Ray Booker. 15 Jun 72, 37p Rept nos. WR201, Scientific-2 AFCRL-72-0350
Contract F19628-70-C-0228

Descriptors: (*Cumulus clouds, *Artificial precipitation), Rainfall, Curve fitting, Graphics, Numerical analysis, Florida.
Identifiers: *Cloud seeding.

During September 1971, a field experiment was held near Patrick Air Force Base, Florida, to study the life cycles of natural and hygroscopically seeded warm tropical cumuli. Measurements of rain at the cloud base with the recalibrated RR40 raindrop spectrometer have shown the following characteristics. Seeding-affected rain appears to be initially visible from seven to ten minutes after seeding. The seeding effects take the form of an increase in the concentration of large drops and an apparent increase in the duration of the seeded showers. (Author)

COM-72-11322 Reprint
National Weather Service, Silver Spring, Md.
A COST-EFFECTIVENESS MODEL FOR EVALUATING AVIATION WEATHER DISSEMINATION TECHNIQUES,
Henry Newhouse. 1972, 8p NOAA-72082124
Pub. in proceedings of International Conference of Aerospace and Aeronautical Meteorology, Washington, D.C., 22-26 May 72, p375-380.

Descriptors: (*Weather communication, Aviation safety), Information systems, Telecommunication, Cost effectiveness, Benefit cost analysis, Mass communication.

The report describes a computer based cost-effectiveness model developed for evaluating a variety of aviation weather information dissemination techniques. Reasons for the models development are discussed and some results of initial model exercises are presented. One of the conclusions was that point dissemination techniques such as request/reply (interrogating a computer via a teletypewriter) cannot effectively compete with mass dissemination techniques such as radio or television on a cost/effectiveness basis. It is suggested that point dissemination should be used to supplement mass techniques in the design of future systems. (Author)

COM-72-11332 PC$3.00/MF$0.95
National Weather Service, Columbia, S.C.
TORNADOES IN SOUTH CAROLINA,
John C. Purvis, H. Landers, and Fred C. Craft. 1972, 58p NOAA-72082117
Prepared in cooperation with South Carolina Civil Defense Agency, and National Weather Service, Clemson, S.C.

Descriptors: (*Tornadoes, South Carolina), Early warning systems, National defense, Weather forecasting.
Identifiers: Tornado watch.

The paper is intended to give the citizens of South Carolina a better understanding of tornadoes and to describe the cooperation between the National Weather Service and Civil Defense in this effort. Following a description of tornadoes, information is given on the frequency of tornadoes in South Carolina, tornado watches and warnings, and how weather warnings are communicated in South Carolina. Data are included on the track of all tornadoes in the period 1916-1965 and a detailed chronology is included. (Author)

COM-72-11334 PC$3.00/MF$0.95
West Virginia Univ., Morgantown. Water Research Inst.
CLIMATE OF THE POTOMAC RIVER BASIN AND CLIMATOLOGICAL SUMMARIES FOR SPRUCE KNOB, WARDENSVILLE, ROMNEY AND MARTINSBURG, WEST VIRGINIA,
R. O. Weedfall, W. H. Dickerson, M. S. Baloch, and E. N. Henry. 1972, 20p Information-6 NOAA-72072414
Pub. in Climatography of the United States No. 20-46.

Descriptors: (*Climate, West Virginia), Potomac River, River basins, Precipitation (Meteorology), Temperature, Evaporation, Seasonal variations.
Identifiers: *Potomac River Basin.

Following a description of the Potomac River Basin, information is given on its climate and on the stations from which data were obtained. There follows a series of data tables designated as: climatological summaries for Spruce Knob, Wardensville, Romney and Martinsberg. These show means and extremes for the period 1931-1970 or portions thereof. Data tables also show total monthly precipitation at Wardensville (1931-1970), and average temperature and average pan evaporation for the same area. In addition, departures in inches from normal growing season rainfall, and probabilities of low temperatures in spring and fall at selected locations are tabulated. (Author)

COM-72-11336 Reprint
National Oceanic and Atmospheric Administration, Princeton, N.J. Geophysical Fluid Dynamics Lab.
ATMOSPHERIC GENERAL CIRCULATION. (I). A. NUMERICAL EXPERIMENT AND THEORETICAL STUDIES. A PREDICTION EXPERIMENT WITH A GLOBAL MODEL OF THE KURIHARA-GRID,
K. Miyakoda, R. W. Moyer, H. Stambler, R. H. Clarke, and R. F. Strickler. 1 Apr 71, 19p NOAA-72082105
Pub. in Jnl. of the Meteorological Society of Japan, v49, Special issue, p521-536 Dec 71.

Descriptors: (*Atmospheric circulation, Atmospheric models), Weather forecasting, Feasibility.

A general circulation model with the global grid system proposed by Kurihara was used to make a two-week forecast. The general characteristics of the model are: 9 vertical levels, a grid interval of approximately 220 km, orography, land-sea distribution, radiation, water vapor and convective adjustment. Data was collected from various regional data centers, and the maps were analyzed manually. The predicted results are compared with independent predictions for each hemisphere, using a hemispheric model of stereographic mapping, and also compared with observed data, where available. (Author)

COM-72-11356 PC$3.00/MF$0.95
National Oceanic and Atmospheric Administration, Rockville, Md.
BENEFITS OF ENVIRONMENTAL PREDICTION IN THE EASTERN GULF OF MEXICO,
Milton G. Johnson. 1972, 16p NOAA-72082125

Pub. in Proceedings of Annual Offshore Technology Conference (4th) Houston, Tex, 1-3 Mar 72. OTC paper no. 1593.

Descriptors: (*Fishing grounds, *Weather forecasting), (*Mexico Gulf, Weather forecasting), Predictions, Water waves, Temperature, Storms, Wind (Meteorology), Benefit cost analysis, Fishing, Recreation, Fisheries, Sea states.

Direct and indirect benefits which may be derived from marine environmental prediction are examined in both quantitative and qualitative terms for the eastern Gulf of Mexico area. Conclusions drawn include the following: Of the primary environmental factors affecting the dimensions and types of benefits being derived from marine resources, five appear particularly relevant to commercial fishing and deep-water recreation in the eastern Gulf: Sea state; Air circulation; Temperature; Precipitation patterns; and Special conditions of tropical storms, fog, etc. Sea state is the most significant factor for marine users, followed by wind information. The cost benefits of such predictions are given. (Author)

COM-72-11359 PC$3.00/MF$0.95
Virginia Polytechnic Inst. and State Univ., Blacksburg. Water Resources Research Center.
CLIMATOLOGICAL SUMMARIES FOR SELECTED STATIONS IN VIRGINIA,
Curtis W. Crockett. Jun 72, 166p VPI-WRRC-Bull-53 NOAA-72090827

Descriptors: (*Climate, Virginia), Rainfall, Snowfall, Temperature, Sunlight, Humidity, Cloud cover, Fog, Thunderstorms, Wind (Meteorology), Abstracts.

The publication presents tabulated and narrative climatological summaries for many locations in Virginia. The period 1941-1970 was chosen for the computation of mean values. The summaries contain information on temperature, precipitation, snowfall, sky cover, sunshine, relative humidity, fog, thunderstorms, and wind. The period 1941-1970 corresponds with the standard time interval supported by the World Meteorological Organization for the computation of climatological normals. (Author)

COM-72-11366 Reprint
National Severe Storms Lab., Norman, Okla.
A COMPARISON OF RAWINSONDE DATA BETWEEN INDIA AND OKLAHOMA DURING THE THUNDERSTORM SEASON,
Richard L. Livingston. 1972, 6p NOAA-72091604
Pub. in Vayu Mandal, Bull. of the Indian Meteorological Society, v2 n1 p9-13, Jan/Mar 72.

Descriptors: (*Oklahoma, Climate), (*India, Climate), (*Climate, Comparison), Thunderstorms, Radiosondes.
Identifiers: Tinker Air Force Base.

A brief discussion of the climate patterns which precede and continue through the severe storm season in both India and in Oklahoma is presented. Rawinsonde data from Calcutta, India, and Tinker Air Force Base, Oklahoma, USA is compared to see if difference may explain the apparent rarity of severe hailstorms and tornadoes in India. Data was collected from the month of May, the peak thunderstorm month of both locales, and an analysis of the temperature range, moisture content, wind shear, and convective instability is given. Examination of fragmentary data of four severe storm days in India during March and April suggests that the occasional storms accompanied by large hail and strong winds in India are associated with strong vertical wind shear and temperature and moisture values similar to those accompany severe storms in Oklahoma. (Author)

COM-72-11371 Reprint
Oklahoma Univ., Norman.
STRUCTURE AND MOVEMENT OF THE SEVERE THUNDERSTORMS OF 3 APRIL 1964 AS REVEALED FROM RADAR AND SURFACE MESONETWORK DATA ANALYSIS,
Jess Charba, and Yoshikazu Sasaki. 6 Mar 71, 26p NOAA-72091650
Grant NOAA-E22-43-70 (G)
Revision of report dated 6 Jul 70. Summary in Japanese.
Pub. in Jnl. of the Meteorological Society of Japan, v49 n4 p191-214, 28 Aug 71.

Descriptors: (*Thunderstorms, Radar cross sections), Wind (Meteorology), Atmospheric pressure, Temperature, Cumulonimbus clouds, Atmospheric sounding, Data processing.

The study is concerned with the pressure and wind field patterns near individual thunderstorms of 3 April 1964 that relate to their radar echo displacement and morphological properties. The analyses focus on the character of the radar echo development, circulation, and translation in relation to highly resolved fields of surface pressure, temperature, moisture and wind. Upper air sounding data collected near the time and space of occurrence of the storm system are used to define the ambient wind direction of the cumulonimbi. The deduced mechanisms (storm translation) are then used to construct a qualitative movement model which attempts to account for the storms movement to the right or to the left of the mean tropospheric flow. (Author)

COM-72-11381 Reprint
Chicago Univ., Ill. Dept. of the Geophysical Sciences.
MESOSCALE MODIFICATION OF SYNOPTIC SITUATIONS FROM THUNDERSTORM DEVELOPMENT AS REVEALED BY ATS III AND AEROLOGICAL DATA,
Kozo Ninomiya. 28 Jun 71, 20p NOAA-72091653
Grants ESSA-E198-2-68- (G), ESSA-E22-41-69 (G)
Revision of report dated 18 Aug 70.
Pub. in Jnl. of Applied Meteorology, v10 n6 p1103-1121 Dec 71.

Descriptors: (*Thunderstorms, Meteorological satellites), Tornadoes, Wind (Meteorology), Jet streams (Meteorology), Synoptic meteorology.
Identifiers: ATS-3 satellite.

Synoptic and dynamic aspects of the development of the tornado-producing thunderstorms of 23 April 1968 were studied by combining conventional observation data with ATS 3 pictures, with special emphasis on the interaction between thunderstorms and the large-scale field. Results of the analysis revealed a significant modification of the moisture, thermal and wind fields in the vicinity of the area where storms developed. The formations of the large-scale cloud band and moist tongue were due to the mesoscale convective disturbances that developed along the frontal zone. It was concluded that the formation of a mid-tropospheric warm core accompanied by a strong upper outflow was the result of a process of so-called convective warming. Both the jet stream and the core of positive vorticity to the left of the jet stream were formed by the increased thermal gradient to the left of the warm core. It was inferred that the modified thermal and vorticity fields caused downward motion and produced the dry area to the rear of the storm area. (Author)

COM-72-11382 PC$3.00/MF$0.95
National Weather Service, Garden City, N.Y. Eastern Region.
AN OBJECTIVE METHOD OF PREPARING CLOUD COVER FORECASTS.
Technical memo.,
James R. Sims. Aug 72, 12p NOAA-TM-NWS-ER-47 NOAA-72091643

Descriptors: (*Weather forecasting, *Cloud cover), Wind (Meteorology), Regression analysis.

Numerical 6-hourly output from the six-layer NMC PE model is used to predict the average daytime cloudiness in the spring for Boston, Ma. The variables chosen as predictors are the PE model predictions of mean relative humidity for the surface to 500 mb. layer, and the 700 mb. vertical velocity. The cloud forecasts are obtained using a regression equation. The results demonstrate forecasting skill, in contrast to persistence, which is shown to be a poor predictor. (Author)

COM-72-11384 Reprint
Environmental Protection Agency, Research Triangle Park, N.C. Div. of Meteorology.
SOME CLIMATOLOGICAL ASPECTS OF HEAT WAVES IN THE CONTIGUOUS UNITED STATES,
John F. Clarke. 1 Oct 71, 10p NOAA-72091634
Pub. in Environmental Research, v5 p76-84 1972.

Descriptors: (*Heat stress, *Climatology), Temperature, Stress (Physiology), Mortality, Meterological data, Humidity, Solar radiation, Wind velocity.
Identifiers: *Bioclimatology, Heat waves.

The midwest has the highest potential for heat waves in the United States. The Gulf Coast is probably least vulnerable because of the moderate extreme temperatures, and the small departures from the normal monthly temperatures. Extreme temperature statistics for exposure periods up to 11 days and normal temperature data are presented for 31 stations as an indication of the potential for heat-related ailments in the U.S. The author points out while many heat waves have been reported in the literature, the climatological potential for heat-related ailments is essentially undocumented. The physiological effects of high temperature depend, among other things, on the temperature to which the body is customarily exposed or acclimated. In addition to average temperature statistics, the climatology should include coincident data on minimum and maximum temperatures, humidity, solar radiation, and wind speed. All of these factors play a role in the effects of heat on the human body. (Author)

COM-72-11393 Reprint
National Severe Storms Lab., Norman, Okla.
ON TORNADOES AND THEIR MODIFICATION,
Edwin Kessler. 1972, 11p NOAA-72091611
Pub. in Technology Review, v74 n6 p1-9 May 72.

Descriptors: (*Tornadoes, *Weather modification), Mathematical models, Convection, Precipitation (Meteorology), Latent heat, Atmospheric physics.

Examines the current understanding of tornadoes and presents three concepts for tornado modification. One concept involves alteration of the effective solar radiant input. Another involves modification of the flow of wind close to the earth's surface. This would be particularly attractive if, tornado suppression by wind reduction could be combined with a technique for converting atmospheric kinetic energy to usable electricity. The third concept involves the alteration of precipitation processes and in this connection a numerical model of convection is presented. The author then examines some plausible precipitation-modifying techniques. (Author)

COM-72-50990 PC-GPO/MF$0.95-NTIS
National Oceanic and Atmospheric Administration, Silver Spring, Md. Environmental Data Service.
CLIMATES OF THE STATES. CLIMATE OF NEW YORK,
A. Boyd Pack. Jun 72, 31p NOAA-72090823
Revision of Climatography of the United States No. 60-30, Feb 60.
Paper copy available from GPO $0.25 as C55.214/60-30.

Descriptors: (*Climate, *New York), Precipitation (Meteorology), Temperature, Floods, Snowfall, Storms, Meteorological data, Tables (Data).

The data summary on the climate of New York presents a brief physical description of the state and brief descriptions of its general climatic features, its temperature, precipitation, snowfall, floods, winds and storms, as well as other climatic elements and their relationship to the economy. (Author)

COM-72-50992 PC-GPO/MF$0.95-NTIS
National Oceanic and Atmospheric Administration, Silver Spring, Md. Environmental Data Service.
CLIMATES OF THE STATES. CLIMATE OF MINNESOTA,
Earl L. Kuehnast. Jun 72, 22p NOAA-72090822
Revison of Climatography of the United States No. 60-21, Dec 59.
Paper copy available from GPO $0.20 as C55.214/60-21.

Descriptors: (*Climate, *Minnesota), Precipitation (Meteorology), Temperature, Floods, Droughts, Agriculture, Recreation, Snowfall, Storms, Meteorological data, Tables (Data).

The data summary on the climate of Minnesota presents brief descriptions and a bibliography of the physical attributes, the temperature, the precipitation, the snowfall, the drought, the storms, the floods, the agriculture and recreation in the state of Minnesota. Tabulated data presented include freeze data, normads by climatological divisions, normals, means, and extremes. Isoline maps are included for mean maximum temperatures in January, mean minimum temperatures in January and mean maximum temperatures in July and mean minimum temperatures in July. The data are based on the period 1951-1970. An isoline map of mean annual precipitation, in inches encompasses the same period. (Author)

COM-72-90074-03 MF$0.95
National Oceanic and Atmospheric Administration, Silver Spring, Md. Environmental Data Service.
MARINERS WEATHER LOG, VOLUME 16, NUMBER 3,
Richard W. Schwerdt. May 72, 72p NOAA-72090812
Paper copy available from Environmental Data Service, Gramax Bldg. (D433), 8060 13th St., Silver Spring, Md. 20910, Free.

Descriptors: (*Marine meteorology, Periodicals), Climatology, Weather observations, North Atlantic Ocean, North Pacific Ocean, Clouds (Meteorology), Wind (Meteorology), Ocean waves, Tropical cyclones, Meteorological data, Oceanographic data, Tables (Data).

The bimonthly publication contains meteorological and climatological information for use by the maritime industry and cooperative National Weather Service marine observers. Subjects include articles on marine meteorology in the North Atlantic and North Pacific Oceans, and on the Great Lakes; and matters of current maritime interest, with attendant graphs and charts. A column entitled 'Hints to the Observer' brings the latest observing techniques and code changes to the cooperating marine observer. Rough Logs of general weather conditions prevailing over the North Atlantic and North Pacific Oceans during the three months prior to preparation of copy for each issue, and Smooth Logs of conditions in these areas for the fourth and fifth months preceding preparation of copy are also furnished. Tables of selected gale data in the areas mentioned above are included, together with a bimonthly summarization of basic climatological conditions for the six United States Ocean Station Vessels. Cyclone tracks over the North Atlantic and North Pacific corresponding to the Smooth Log months are also included. (Author)

COM-72-90074-03-01
(Order as COM-72-90074-03)
National Environmental Satellite Service, Coral Gables, Fla.
SHIP AND SATELLITE - OBSERVED CLOUDS AND LEE WAVES NEAR THE BERING STRAIT,
H. McClure Johnson, and Ronald L. Holle. 1972, 9p NOAA-72090812-1
Included in Mariners Weather Log, v16 n3 p143-148 May 72, COM-72-90074-03.

Descriptors: (*Clouds (Meteorology), Weather observations), Bering Sea, Photographic analysis, Spaceborne photography, Wind (Meteorology).
Identifiers: ESSA-9 satellite.

The captain of the NOAA Ship SURVEYOR had a chance encounter with unusual cloud structure near the Bering Strait in August 1969. The photographs he snapped were submitted to NOAA researchers Johnson and Holle who submitted them to self-study. The ship-observed altocumulus structure of the clouds and the periodic pressure oscillation of the SURVEYOR'S barogram are well correlated, in time and space in a general way, with the clearly revealed presence of lee-wave line cloud trains close to the ship, both upstream and downstream, shown by satellite pictures. They are also well correlated in detail with each other and with the low-quality but usable indications of poorly resolved satellite-observed details of lee-wave line cloud structure over the ship. The evidence suggests that a pressure minimum corresponds fairly closely with the overhead presence of a gap between lee-wave line clouds. (Author)

COM-72-90074-03-02
(Order as COM-72-90074-03)
National Oceanic and Atmospheric Administration, Silver Spring, Md. Environmental Data Service.
GREAT LAKES NAVIGATION, 1971,
Richard W. Schwerdt. 1972, 9p NOAA-72090812-2
Included in Mariners Weather Log, v16 n3 p148-164 May 72, COM-72-90074-03.

Descriptors: (*Marine meteorology, Great Lakes), Ice, Navigation, Storm tracks, Wind (Meteorology), Meteorological data, Tables (Data).

The 1971-72 season of Navigation on the Great Lakes opened at its usual time on April 1, 1971 and closed on February 1, 1972. Severe weather is emphasized in the month by month account. National Weather Service aids to navigation are explained. Tabulated data are included: Maximum wind speed each month on the Great Lakes; the highest 1-min wind (kt) reported on each of the Great Lakes since 1941. A figure shows the tracks of storms with winds greater than 50 kt or fresh open-water seas greater than 20 feet. Ice conditions are also described. (Author)

N72-28333 PC$4.75/MF$0.95
Applied Physics Lab., Johns Hopkins Univ., Silver Spring, Md.
TROPOSPHERIC RANGE ERROR PARAMETERS FURTHER STUDIES.
H. S. Hopfield. Jun 72, 51p NASA-CR-127559, APL/JHU-CP-015
Contract N00017-72-C-4401
Subm- Sponsored By Nasa

Descriptors: *Meteorology, *Range (extremes), *Troposphere, Balloon sounding, Predictions, Refractivity.

For abstract, see STAR 10 19.

N72-28638 PC$3.00/MF$0.95
Allied Research Associates, Inc., Baltimore, Md.
FOUR-DIMENSIONAL WORLD-WIDE ATMOSPHERIC MODELS (SURFACE TO 25 KM ALTITUDE).
D. B. Spiegler, and M. G. Fowler. Jul 72, 74p
NASA-CR-2082, REPT-9G-88F
Contract NAS8-26928

Descriptors: *Atmospheric attenuation, *Atmospheric models, Computer techniques, Computerized simulation, Meteorological parameters.

For abstract, see STAR 10 19.

N72-28639 PC$3.25/MF$0.95
Finnish Meteorological Inst., Helsinki.
NUMERICAL WEATHER PREDICTION IN FINLAND DURING 1969.
D. Soederman. Dec 71, 22p TR-1

Descriptors: *Computer programs, *Finland, *Numerical weather forecasting, Climatology, Data acquisition, Data processing, Meteorological parameters.

For abstract, see STAR 10 19.

N72-28644 PC$8.75/MF$0.95
Istituto Di Fisica Dell Atmosfera, Rome (Italy).
REPORT ON THE ORGANIZATIONAL, SCIENTIFIC AND DIDACTIC ACTIVITY OF THE INSTITUTE OF ATMOSPHERIC PHYSICS FOR THE FISCAL YEAR 1970 . RELAZIONE SULLATTIVITA ORGANIZZATIVA SCIENTIFICA E DIDATTICA DELLIFA.
Feb 71, 134p IFA-TR-33

Descriptors: *Atmospheric physics, *Meteorology, Aeronomy, Air pollution, Atmospheric electricity, Climatology, Education, Magnetosphere, Meteoroids, Radioactivity, Upper atmosphere.

For abstract, see STAR 10 19.

N72-28649 PC$3.00/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
CLIMATOLOGICAL OBSERVATIONS . OBSERVATIONS CLIMATOLOGIQUES BULLETIN MENSUEL, AVRIL 1972.
Monthly Bulletin, Apr. 1972
R. Sneyers. Apr 72, 15p
LANG- IN FRENCH AND DUTCH

Descriptors: *Belgium, *Meteorological parameters, *Tables (data), Atmospheric moisture, Beta particles, Fallout, Precipitation (meteorology), Storms (meteorology), Sunlight, Wind (meteorology).

For abstract, see STAR 10 19.

N72-29636 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
WIND VELOCITY PROFILES MEASURED BY THE SMOKE-TRAIL METHOD AT WALLOPS ISLAND, VIRGINIA, 1965 - 1969.
R. H. Rhyne, J. C. Manning, and R. M. Henry. Aug 72, 96p NASA-TN-D-6861, L-8336

Descriptors: *Smoke trails, *Wallops island, *Wind profiles, Sondes, Wind measurement, Wind velocity.

For abstract, see STAR 10 20.

N72-29643 PC$3.00/MF$0.95
Lockheed-california Co., Burbank. Environmental Sciences Lab.
JIMSPHERE WIND AND TURBULENCE EXCEEDANCE STATISTIC.
Technical Report, 24 Nov. 1970 - 23 Nov. 1971
S. I. Adelfang, and A. Court. Aug 72, 54p
NASA-CR-2118, LR-24843
Contract NAS8-26661

Descriptors: *Balloon sounding, *Cape kennedy launch complex, *Gusts, *Low level turbulence, *Spacecraft launching, *Wind profiles, Spacecraft design, Wind measurement, Wind shear.

For abstract, see STAR 10 20.

N72-29644 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
INFLUENCE OF TYPE OF SOIL ON NOCTURNAL TEMPERATURE VARIATIONS IN THE GROUND LEVEL LAYER OF AIR.
K. Grasnick. Aug 72, 18p NASA-TT-F-14508
Contract NASW-2035
Tran- Transl. Into English From Z. Meteorol. (Berlin), V. 15, No. 1-6, Jan.-jun. 1961 P 27-36

Descriptors: *Atmospheric temperature, *Lower atmosphere, *Soils, Diurnal variations, Lapse rate, Thermodynamics.

For abstract, see STAR 10 20.

N72-29647 PC$3.00/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
CLIMATOLOGICAL OBSERVATIONS . OBSERVATIONS CLIMATOLOGIQUES, BULLETIN MENSUEL, MAI 1972.
Monthly Bulletin, May 1972
R. Sneyers. May 72, 17p
LANG- IN FRENCH AND DUTCH

Descriptors: *Belgium, *Meteorological parameters, Atmospheric moisture, Beta particles, Fallout, Precipitation (meteorology), Storms (meteorology), Sunlight, Tables (data), Wind (meteorology).

For abstract, see STAR 10 20.

N72-30346 PC$4.50/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TROPOSPHERIC RANGE ERROR PARAMETERS FURTHER STUDIES.
H. S. Hopfield. Aug 72, 48p NASA-TM-X-66002, X-551-72-285

Descriptors: *Electromagnetic radiation, *Meteorological parameters, *Surface properties, *Troposphere, Errors, Meteorological balloons, Rangefinding.

For abstract, see STAR 10 21.

N72-30449 PC$3.00/MF$0.95
Institut Franco-allemand de Recherches, St. Louis (France).
FOG METROLOGY BY HOLOGRAPHY . METROLOGIE DES BROUILLARDS PAR HOLOGRAPHIE.
H. Royer. 29 May 72, 17p ISL-NB-1/72
Conf- Presented At the Meeting on Appl. des Lasers A La Metrologie Et Au Domaine Aerospatial, 21 Jun. 1972 Sponsored By Soc. des Electriciens Et Electroniciens

Descriptors: *Calibrating, *Drop size, *Drops (liquids), *Fog, *Holography, Aircraft performance, Concentration (composition), Flow visualization, Imaging techniques, Laser outputs, Ruby lasers.

For abstract, see STAR 10 21.

N72-30550 PC$6.25/MF$0.95
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
INTERHEMISPHERIC COMPARISON OF ATMOSPHERIC CIRCULATION FEATURES AS EVALUATED FROM NIMBUS SATELLITE DATA.
Annual Report, 1 Jul. 1971 - 30 Jun. 1972
E. R. Reiter, T. H. Vonderhaar, J. E. Lovill, R. Adler, and S. Srivatsangam. 30 Jun 72, 81p NASA-CR-127915
Contract NGR-06-002-098

Descriptors: *Atmospheric circulation, *Infrared spectroscopy, *Interferometry, *Nimbus 3 satellite, *Northern hemisphere, *Ozone, *Southern hemisphere, Atmospheric temperature, Meteorological parameters, Tropopause.

For abstract, see STAR 10 21.

N72-30551 PC$3.00/MF$0.95
Techtran Corp., Glen Burnie, Md.
METEOROLOGICAL FLIGHT CONDITIONS FOR SUPERSONIC AIRCRAFT.
I. G. Pchelko, N. V. Peterenko, and G. S. Buldovskiy. Jul 72, 184p NASA-TT-F-693
Contract NASW-2037
Tran- Transl. Into English of the Publ. Meteorologicheskiye Usloviya Poletov Sverkhzvukovykh Samoletov Leningrad, Hydrometeorol. Press, 1970

Descriptors: *Atmospheric composition, *Meteorological parameters, *Supersonic flight, Atmospheric circulation, Atmospheric turbulence, Sonic booms, Stratosphere.

For abstract, see STAR 10 21.

N72-30554 PC$3.00/MF$0.95
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
PROJECT FOG DROPS. PART 1 INVESTIGATIONS OF WARM FOG PROPERTIES.
R. Pilie, W. Eadie, E. J. Mack, C. Rogers, and W. C. Kocmond. Aug 72, 151p NASA-CR-2078, RM-3005-M-5-PT-1
Contract NASW-2126

Descriptors: *Atmospheric models, *Fog, *Micrometeorology, Cloud physics, Meteorological parameters, New york, Visibility.

For abstract, see STAR 10 21.

N72-30555 PC$3.00/MF$0.95
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
PROJECT FOG DROPS. PART 2 LABORATORY INVESTIGATIONS.
W. C. Kocmond, E. J. Mack, U. Katz, and R. J. Pilie. Jul 72, 40p NASA-CR-2079, RM-3005-M-6-PT-2
Contract NASW-2126

Descriptors: *Cloud seeding, *Fog, *Photochemical reactions, Aerosols, Cloud physics.

For abstract, see STAR 10 21.

N72-30561 PC$3.00/MF$0.95
Istituto Di Fisica Dell Atmosfera, Rome (Italy).
ATMOSPHERIC STABILITY AND AIR POLLUTION (PROPOSAL OF A SIMPLE METHOD FOR EVALUATING AIR STABILITY CONDITIONS) . LA STABILITA ATMOSFERICA E GLI INQUINAMENTI AERODIFFUSI (PROPOSTA DI UN METODO SEMPLICE DI APPREZZAMENTO DELLE CONDIZIONI DI STABILITA DELLARIA).
L. Mammarella. Dec 70, 15p IFA-RDP-35

Descriptors: *Air pollution, *Atmospheric stratification, *Parameterization, *Temperature inversions, Air currents, Fog, Humidity measurement, Visibility, Wind velocity.

For abstract, see STAR 10 21.

N72-30569 PC$7.50/MF$0.95
Max-planck-institut Fuer Stromungsforschung, Gottingen (West Germany).
SUBTROPICAL JET STREAM DYNAMICS . ZUR DYNAMIK SUBTROPISCHER STRAHLSTROEME.
Thesis - Goettingen Univ.
H. Leinemann. 1972, 108p REPT-4/1972
Subm- Sponsored By Deut. Forschungsgemeinschaft

Descriptors: *Euler equations of motion, *Jet streams (meteorology), *Kinetic energy, *North america, *Radiosondes, Flow distribution, Hydrodynamics, Winter.

For abstract, see STAR 10 21.

N72-30571 PC$4.75/MF$0.95
France. Direction de La Meteorologie Nationale, Paris.
UPPER WIND OVER FRENCH POLYNESIA . LE VENT EN ALTITUDE AU-DESSUS DE LA POLYNESIE FRANCAISE.
A. Dhauteserre. Apr 72, 55p MONO-85

Descriptors: *Annual variations, *Pacific islands, *Upper atmosphere, *Wind variations, Atmospheric circulation, France, Statistical analysis, Vertical distribution, Wind direction, Wind profiles, Wind velocity.

For abstract, see STAR 10 21.

N72-30572 PC$3.00/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
CLIMATOLOGICAL OBSERVATIONS . OBSERVATIONS CLIMATOLOGIQUES BULLETIN MENSUEL, JUIN 1972.
Monthly Bulletin, Jun. 1972
R. Sneyers. Jun 72, 17p
AND Dutch
LANG- IN FRENCH

Descriptors: *Belgium, *Meteorological parameters, *Tables (data), Atmospheric moisture, Beta particles, Fallout, Precipitation (meteorology), Storms (meteorology), Sunlight, Wind (meteorology).

For abstract, see STAR 10 21.

N72-30573 PC$3.75/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
SYNOPTIC OBSERVATIONS . OBSERVATIONS SYNOPTIQUES BULLETIN MENSUEL, SEPTEMBRE 1971.
Monthly Bulletin, Sep. 1971
1972, 32P
LANG- IN FRENCH AND DUTCH

Descriptors: *Belgium, *Synoptic meteorology, *Tables (data), Periodic variations, Radiosondes, Weather stations.

For abstract, see STAR 10 21.

N72-30574 PC$3.75/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
SYNOPTIC OBSERVATIONS . OBSERVATIONS SYNOPTIQUES BULLETIN MENSUEL, AOUT 1971.
Monthly Bulletin, Aug. 1971
1972, 32P
LANG- IN FRENCH AND DUTCH

Descriptors: *Belgium, *Synoptic meteorology, Periodic variations, Radiosondes, Tables (data), Weather stations.

For abstract, see STAR 10 21.

N72-30575 PC$3.75/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
SYNOPTIC OBSERVATIONS . OBSERVATIONS SYNOPTIQUES BULLETIN MENSUEL, JUILLET 1971.
Monthly Bulletin, Jul. 1971
1972, 32P
LANG- IN FRENCH AND DUTCH

Descriptors: *Belgium, *Synoptic meteorology, *Tables (data), Periodic variations, Weather stations.

For abstract, see STAR 10 21.

TT-71-50132 PC$3.00/MF$0.95
National Oceanic and Atmospheric Administration, Rockville, Md.
INTRODUCTION TO THE NONLINEAR THEORY OF MESOSCALE METEOROLOGICAL PROCESSES,
L. N. Gutman. 1972, 229p
Trans. of mono. Vvedenie v Nelineinuyu Teoriyu Mezometeorologicheskikh Protsessov, Leningrad, 1969, by D. Ledermaan. Sponsored in part by the National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program. International standard book no. 0-7065-1248-0.

Descriptors: (*Weather forecasting, Nonlinear systems), Wind (Meteorology), Air masses, Fronts (Meteorology), Cumulus clouds, Tornadoes, Hydrodynamics, Partial differential equations, Temperature inversions, Numerical integration, Translations, USSR.
Identifiers: *Mesoscale forecasting.

Contents:
Thermodynamic equations of mesometeorological processes;
Effect of surface irregularities on the motion of air masses;
Fronts;
Thermals;
Cumulus clouds;
Whirlwinds and tornadoes;
Local winds.

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-750 301 PC$3.00/MF$0.95
Office Chief of Research and Development (Army) Washington D C
KEYNOTE ADDRESS,
William C. Bribble, Jr. 18 Oct 72, 7p

Descriptors: (*Army research, *Reviews), Scientific research, Research program administration.
Identifiers: Technology assessment.

A review is presented of trends and accomplishments in Army research and development.

AD-750 302 PC$3.00/MF$0.95
Defence Research Board Ottawa (Ontario)
TRENDS IN RESEARCH AND DEVELOPMENT - CANADA,
N. J. B. Wiggin. 1972, 8p

Descriptors: (*Scientific research, Canada), Research program administration, Reviews.

The report contains a speech made by Dr. Wiggin in which he discusses policies, history, and trends in Canadian government research.

AD-750 488 PC$3.25/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE ESTABLISHMENT OF BRANCH-WIDE AUTOMATIC INDUSTRIAL MANAGEMENT SYSTEMS (OASU),
N. V. Belkin, and T. P. Timofeevskii. 11 Aug 72, 23p Rept no. FTD-HT-23-519-72
Edited trans. from Mekhanizatsiya i Avtomatizatsiya Proizvodstva (USSR) n7 p43-46 1970, by R. J. Zeccola.

Descriptors: (*Industries, *Management engineering), Industrial production, Automatic, Organizations, Data transmission systems, Information retrieval, USSR, Control systems.
Identifiers: Translations, Management information systems.

A central control system is proposed with its supreme head at the ministry. Hierarchy of the system is shown on a block diagram with all the commands coming from the ministry. Information gathering centers are shown together with the communication lines for transfer of information. It is concluded that each sub system must contain a highly qualified creative group technically responsible for all the work. Each group should have an administrator equal in rank to the deputy director who is normally responsible for execution of the contract. Finally it is concluded that it is essential that the pay structure contains incentive bonuses and piece work (where applicable) so that efficiency is maintained. (Author)

AD-750 847 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
DETERMINATION OF PERFORMANCE INDICATORS FOR THE UNITED STATES AIR FORCE BASE LEVEL TRANSPORTATION FUNCTION.
Master's thesis,
Donald H. Weisert, and Sidney H. Clarke. 15 Sep 72, 128p Rept no. SLSR-24-72B

Descriptors: (*Management planning, *Armed forces transportation), (*Performance (Human), Psychometrics), Air force operations, Theses.
Identifiers: *Management information systems.

The identification of indicators of performance is an important step in the development of a management information system. Some of the performance indicators, as they would apply to the base transportation squadron, are identified in the study. Base transportation officers were surveyed and their responses analyzed to identify indicators that would be appropriate for inclusion in a management information system. Recommendations are presented for further research in the development of a management information system for base transportation officers. (Author)

N72-28931 PC$7.75/MF$0.95
Stanford Research Inst., Menlo Park, Calif.
ACTIVITIES OF THE NASA SPONSORED SRI TECHNOLOGY APPLICATIONS TEAM IN TRANSFERRING AEROSPACE TECHNOLOGY TO THE PUBLIC SECTOR.
Annual Report, 1 Jul. 1970 - 30 Jun. 1971
J. G. Berke. Jul 71, 113p NASA-CR-127453
Contracts NASW-1992, SRI PROJ. PYU-8368

Descriptors: *Data retrieval, *Data systems, *Information retrieval, *Technology utilization, Information systems, Selective dissemination of information, Sociology.

For abstract, see STAR 10 19.

N72-28933 PC$4.50/MF$0.95
Stanford Research Inst., Menlo Park, Calif.
TRANSFER OF AEROSPACE TECHNOLOGY TO SELECTED PUBLIC SECTOR AREAS OF CONCERN.
Semiannual Report, 1 Jul. - 31 Dec. 1971
J. G. Berke. Jan 72, 48p NASA-CR-127438, SAR-2
Contracts NASW-1992, SRI PROJ. PYU-8368

Descriptors: *Information retrieval, *Technology transfer, *Technology utilization, Selective dissemination of information, Sociology, Urban transportation.

For abstract, see STAR 10 19.

N72-28938 PC$11.50/MF$0.95
Nauka Press, Moscow (USSR.
PLANNING AND CONTROL OF SCIENTIFIC RESEARCH.
K. L. Gorman. 1971, 188p

Descriptors: *Decision theory, *Organizing, *Planning, Algorithms, Mathematical models, Research.

For abstract, see STAR 10 19.

N72-28939 PC$9.50/MF$0.95
Nauka Press, Leningrad (USSR.
ADMINISTRATIVE ORGANIZATION OF SCIENTIFIC RESEARCH . ORGANIZATSIYA UPRAVLENIYA NAUCHNYMI ISSLEDOVANIYAMI.
K. A. Lange. 1971, 149p

Descriptors: *Management methods, *Research, Control, Data systems, U.S.S.R..

For abstract, see STAR 10 19.

N72-28970 PC$4.75/MF$0.95
George Washington Univ., Washington, D.C.
DESIGN EVALUATION IN TECHNOLOGY ASSESSMENT ILLUSTRATED BY AUDITORY IMPEDANCE AND SOUND DISTRIBUTION PROBLEMS.
J. F. Halldane. 9 Mar 72, 51p NASA-CR-127478, GWPS-MON-12
Contract NGL-09-010-030
Conf- Presented At Seminar No. 2 of An Evening Ser. on Technol. Assessment Methodlogy, Washington, D. C., 9 Mar. 1972

Descriptors: *Culture (social sciences), *Ecology, *Human reactions, *Technology assessment, Noise pollution, Parameterization, Policies, Resource allocation, Sociology.

For abstract, see STAR 10 19.

N72-28987 PC$3.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
NASA WORK UNIT SYSTEM FILE MAINTENANCE MANUAL.
Aug 72, 51p NASA-TM-X-2608

Descriptors: *Management information systems, *Nasa programs, Contracts, Remote consoles, Research and development.

For abstract, see STAR 10 19.

N72-28988 PC$3.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
NASA WORK UNIT SYSTEM USERS MANUAL.
Aug 72, 62p NASA-TM-X-2609

Descriptors: *Management information systems, *Manuals, *Nasa programs, Contracts, Terminals, Time sharing, Video equipment.

For abstract, see STAR 10 19.

N72-29297 PC$3.00/MF$0.95
Department of Energy, Mines and Resources, Ottawa (Ontario).
RECOMMENDED NATIONAL PROGRAM FOR REMOTE SENSING.
1972, 14p

Descriptors: *Earth resources technology satellites, *Remote sensors, Canada, Cost analysis, Data processing, Earth resources.

For abstract, see STAR 10 20.

N72-29975 PC$7.50/MF$0.95
Grumman Aerospace Corp., Bethpage, N.Y.

PROGRAM MANAGEMENT AID FOR REDUNDANCY SELECTION AND OPERATIONAL GUIDELINES.
Final Report
P. W. Hodge, W. L. Davis, and B. Frumkin. Jan 72, 108p NASA-CR-128494
Contract NAS10-7697

Descriptors: *Decision making, *Project management, *Redundancy, Economics, Mission planning, Space shuttles.

For abstract, see STAR 10 20.

N72-29979 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
GENERAL METHODOLOGY COSTING, BUDGETING, AND TECHNIQUES FOR BENEFIT-COST AND COST-EFFECTIVENESS ANALYSIS.
D. M. Stretchberry, and G. F. Hein. Aug 72, 20p NASA-TM-X-2614, E-6906

Descriptors: *Cost analysis, *Cost effectiveness, *Management planning, Budgeting, Economic analysis, Project management, Value engineering.

For abstract, see STAR 10 20.

PB-212 455 PC$3.75/MF$0.95
Region L Council of Governments, Rocky Mount, N.C.
REGION L CLEARINGHOUSE PROCEDURES MANUAL.
Final rept.
Sep 72, 31p RLCOG-72-01

Descriptors: (*Financial management, North Carolina), Project planning, Local government, State government, Environmental surveys, Reviewing.
Identifiers: *Federal assistance programs.

The manual familiarizes local government officials, private agencies, and private citizens with the methods used in reviewing notifications of Intent to Apply for Federal Assistance. It shows them how to submit a notification in the proper manner. This manual also gives a listing of the programs covered by OMB Circular A-95, a copy of the Notification form and the names of contacts in the State and Regional Clearinghouse. (Author)

PB-212 536 PC$5.75/MF$0.95
Tennessee State Planning Commission, Nashville.
STATE OF TENNESSEE FINANCIAL INFORMATION AND CONTROL SYSTEM. SYSTEM DOCUMENTATION.
Jul 72, 72p TN-DATS-0-72-140-2

Descriptors: (*Financing, Management control reports), (*Accounting, *Tennessee), State government, Budgeting, Data processing, Reporting, Systems engineering, Computer programming, Computer logic.
Identifiers: On line capabilities, *Financial information systems.

The State of Tennessee financial information and control system is designed and is being implemented to provide considerable flexibility for the users through the following facilities: input processing, output processing, system file concepts and levels of control. The major sections of the document are detailed under input transactions, processing logic, system output, on-line capabilities and implementation.

PB-212 537 PC$12.00/MF$0.95
Tennessee State Planning Commission, Nashville.
STATE OF TENNESSEE FINANCIAL INFORMATION AND CONTROL SYSTEM. SYSTEM REPORTS.
Jul 72, 198p TN-DATS-0-72-140-3

Descriptors: (*Financing, Management control reports), (*Accounting, Tennessee), State government, Project planning, Cost engineering, Reporting, Budgeting, Cash flow, Systems engineering, Control.
Identifiers: *Financial information systems.

Four categories of management control reports are described: responsibility reports, program reports, project reports, and unit cost reports. Three other types of reports are illustrated: budget development reports, cash management reports, and accounting reports.

PB-212 559 PC$3.00/MF$0.95
Denver Urban Observatory, Colo.
LOCAL GOVERNMENT FINANCE IN THE DENVER METROPOLITAN REGION. FIRST-YEAR REPORT.
Final rept.,
William O. Winter, Chris H. Tomasides, James Adams, and John W. Richeson. Apr 72, 102p UO-LCCM-DEN-72-003
Contract HUD-H-987

Descriptors: (*Financing, *Local government), (*Colorado, Financing), Urban areas, Revenue, Expenses, Economic forecasting.
Identifiers: Adams County (Colorado), Arapahoe County (Colorado), Boulder County (Colorado), Jefferson County (Colorado), Denver County (Colorado).

The report is concerned with historical data drawn from the twelve-year period, 1957-1969, and includes projections through 1975 relating to revenue and expenditures for all local governments in Adams, Arapahoe, Boulder, and Jefferson counties and the City and County of Denver. Although some mention is made of possible solutions to the financial dilemmas faced by these local jurisdictions, the major objectives of this report are: to provide basic information concerning historical and projected finances of local governments in the Denver area; to expose the potential gaps that may develop between revenues and expenditures through 1975; and to provide comparable data that will be included in a comprehensive report on the fiscal needs of the nation's cities. (Author)

PB-212 747 PC$3.00/MF$0.95
Mid-America Urban Observatory, Kansas City, Mo.
LOCAL FINANCE AND REVENUE SHARING IN THE KANSAS CITY SMSA 1957 TO 1980.
Final rept.,
G. Ross Stephens, and L. Kenneth Hubbell. Aug 72, 156p UO-LCCM-KC-72-002
Contract HUD-H-987
Prepared in cooperation with Missouri Univ., Kansas City.

Descriptors: (*Local government, *Financing), (*Revenue, *Kansas), (*Financial management, *Missouri), Cost analysis, Expenses, Urban planning, Economic surveys, Trends, Statistical data, Government policies, Budgeting, Forecasting, Classifications, Mathematical prediction, Taxes.
Identifiers: *Kansas City metropolitan area, Standard metropolitan statistical areas, *Revenue sharing.

Between 1957 and 1972 the cost of local governments in the Kansas City region quadrupled and can be expected to nearly double again by 1980, with increased costs a reflection of higher prices for the things government buys, a larger service population, increased service levels, and inflation. Due to the inelasticity of local sources, revenues are reported on as not increasing as fast as expenditure needs. The greatest fiscal needs or potential service deficits are represented by the school districts and county governments. In terms of need, revenue sharing is discussed for its impact upon local governments in the Kansas City SMSA.

5B. Documentation and Information Technology

AD-750 300 PC$6.00/MF$0.95
Office Chief of Research and Development (Army) Washington D C
PROCEEDINGS OF THE 1972 ARMY SCIENCE CONFERENCE HELD AT UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y., 20-23 JUNE 1972. VOLUME I. KEYNOTE ADDRESS, INVITED PAPERS, PRINCIPAL AUTHORS A THROUGH G.
23 Jun 72, 358p
See also Volume 2, AD-750 326.

Descriptors: (*Armed forces research, *Symposia), Rocket research, Medical research, Military medicine, Armed forces supplies, Military requirements, Health physics, Ballistics, Aerodynamics, Armed forces operations, Detonations, Test equipment.
Identifiers: *Technology utilization and transfer.

The report is a compilation of achievements, researches, and exploratory developments in military sciences. Technological assessment of research and development projects, leading to the technology transfer of endeavors, is made. This volume is limited to principal authors alphabetized A thru G. (Author)

AD-750 326 PC$6.00/MF$0.95
Office Chief of Research and Development (Army) Washington D C
PROCEEDINGS OF THE 1972 ARMY SCIENCE CONFERENCE HELD AT UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y., 20-23 JUNE 1972. VOLUME II. PRINCIPAL AUTHORS H THROUGH L.
23 Jun 72, 341p
See also Volume 1, AD-750 300, and Volume 3, AD-750 360.

Descriptors: (*Armed forces research, *Symposia), Rocket research, Medical research, Military medicine, Armed forces supplies, Military requirements, Health physics, Ballistics, Aerodynamics, Armed forces operations, Detonations, Test equipment.
Identifiers: *Technology utilization and transfer.

The report, the second volume of a three volume series, contains papers presented at a research and development symposium on military sciences. The volume contains articles by principal authors alphabetized H thru L.

AD-750 360 PC$9.00/MF$0.95
Office Chief of Research and Development (Army) Washington D C
PROCEEDINGS OF THE 1972 ARMY SCIENCE CONFERENCE HELD AT UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y., 20-23 JUNE 1972. VOLUME III. PRINCIPAL AUTHORS M THROUGH Z.
23 Jun 72, 630p
See also Volume 2, AD-750 326.

Descriptors: (*Armed forces research, *Symposia), Rocket research, Medical research, Military medicine, Armed forces supplies, Military requirements, Health physics, Ballistics, Aerodynamics, Armed forces operations, Detonations, Test equipment.
Identifiers: *Technology utilization and transfer.

The report, the third volume of a three part series, concludes presentations made at a symposium relative to research and development activities in military sciences. Principal authors alphabetized M thru Z are included in this volume of the report. (Author)

AD-750 400 PC$6.75/MF$0.95
Defense Documentation Center Alexandria Va

DEFENSE DOCUMENTATION CENTER REFERRAL DATA BANK DIRECTORY,
Alice L. Cox. Sep 72, 263p* Rept no. DDC-TR-72-3
Revision of report dated Jul 71, AD-724 700.

Descriptors: (*Technical information centers, *Directories), (*Libraries, Directories), Documentation, Sources, Organizations, Information retrieval.

The revised directory of the information sources in the DDC Referral Data Bank (previously issued in October 1970 as AD-712 800 and in July 1971 as AD-724 700) consists of a compilation of computer printouts, each of which gives for a single activity detailed descriptive information on the mission, scope and services provided. Arrangement is by referral accession number with indexes by activity, director/contact, and subject. (Author)

AD-750 527 PC$3.00/MF$0.95
Informatics Inc Rockville Md
SELECTED MATERIAL FROM SOVIET TECHNICAL LITERATURE, AUGUST 1972,
Stuart G. Hibben. 4 Oct 72, 89p AFOSR-TR-72-1999
Contract F44620-72-C-0053, ARPA Order-1622
See also July issue, AD-750 127.

Descriptors: (*Scientific research, USSR), (*Bibliographies, Scientific research), Lasers, Coherent radiation, Explosion effects, Nuclear explosions, Particle beams, Particle accelerators, Charged particles, Construction materials, Alloys, Superconductors, Semiconductors, Structural geology.

The report includes bibliographic lists on major contractual subjects that were completed in August 1972. The major topics are: laser technology, effects of strong explosions, geosciences, and particle beams. A section on material science has been included as the optional fifth topic, as well as a section on items of miscellaneous interest. To avoid duplication in reporting, only laser entries concerning high-power effects have been included, since all current laser material will appear routinely in the quarterly bibliographies. (Author)

AD-750 557 PC$3.00/MF$0.95
Defence Research Information Centre Orpington (England)
LIBRARY BULLETIN, NO. 7, 1972.
1972, 74p
See also AD-746 726.

Descriptors: (*Scientific research, *Reports), Atmosphere, Physics, Biology, Medicine, Chemistry, Engineering, Materials, Mathematics, Navigation, Detection, Communication systems, Nuclear physics, Astronautics, Propulsion, Fuels, Great Britain.
Identifiers: Announcement bulletins.

Contents:
Accession list of publications;
Selected references to current periodical literature held in Defence Research Information Centre Library.

AD-750 653 PC$3.00/MF$0.95
Office of Naval Research London (England)
INTERNATIONAL CRANFIELD AEROSPACE INSTRUMENTATION SYMPOSIUM (7TH) HELD AT CRANFIELD, ENGLAND ON 20-23 MARCH 1972.
Conference rept.,
Arthur A. Ranger. 1 Sep 72, 14p Rept no. ONRL-C-12-72

Descriptors: (*Scientific research, Europe), Instrumentation, Aerospace craft, Symposia, Programming (Computers), Tests.

The report discusses the highlights of a 1972 aerospace symposia devoted to the topic of instrumentation. The complete program is included as an appendix and the information necessary to obtaining a copy of the proceedings is presented. (Author)

AD-750 669 PC$3.00/MF$0.95
Stanford Univ Calif Stanford Electronics Labs
SEMI-ANNUAL STATUS REPORT NO. 122, 1 JANUARY THROUGH 30 JUNE 1972.
30 Jun 72, 133p Rept no. SU-SEL-72-035
Contract N00014-67-A-0112-0044
See also AD-739 707.

Descriptors: (*Electronics, Scientific research), Plasma physics, Lasers, Integrated circuits, Solid state physics, Information theory, Digital systems, Data processing systems, Atmospheric sounding, Pattern recognition, Semiconductors.
Identifiers: *Quantum electronics, Multiprogramming, Parallel processors, Large scale integrated circuits.

Contents:
Plasma physics and quantum electronics;
Radioscience;
Integrated circuits;
Solid state;
Information systems;
Digital systems.

AD-750 728 PC$3.00/MF$0.95
Office of Naval Research Arlington Va
OFFICE OF NAVAL RESEARCH ANNUAL REPORT FOR 1971.
1971, 129p

Descriptors: (*Naval research, Reports), Biology, Medical research, Laboratories, Psychology, Materials, Metallurgy, Chemistry, Oceanology, Lasers, Underwater sound, Communication systems.

Contents:
The Navy contract research program;
The Naval research laboratory;
The Naval Arctic research laboratory;
The Naval biomedical research laboratory.

AD-750 734 PC$3.00/MF$0.95
Informatics Inc Rockville Md
SELECTED MATERIAL FROM SOVIET TECHNICAL LITERATURE, MAY 1972,
Stuart G. Hibben. 7 Jul 72, 159p AFOSR-TR-72-1964
Contract F44620-72-C-0053, ARPA Order-1622

Descriptors: (*Scientific research, USSR), (*Bibliographies, Scientific research), Lasers, Blast, Geophysics, Particle beams.
Identifiers: Annotated bibliographies.

The report Soviet technical literature includes abstracts and bibliographic lists on major contractual subjects that were completed in May, 1972. The major topics are: laser technology, effects of strong explosions, geosciences, and particle beams. A report on biocybernetic studies will be issued under separate cover. Only laser entries concerning high-power effects were included.

ED-063 956 Not available NTIS
Library of Congress, Washington, D.C.
REGISTER OF COPYRIGHTS. ANNUAL REPORT (74TH) FOR THE FISCAL YEAR ENDING JUNE 30, 1971.
1972, 27p
Available from ERIC Document Reproduction Service, Bethesda, Md. 20014 PC$3.29, MF$0.65.

Descriptors: (*Copyrights, *Federal legislation), (*Court litigation, Copyrights), (*International programs, Copyrights), (*Depository libraries, Copyrights), (*National libraries, Government libraries), (*Depository libraries, Annual reports).
Identifiers: *Library of Congress.

Discussed in the 1971 annual report of the Register of Copyrights to the Librarian of Congress are the following topics: (1) General revision of the copyright law, (2) The year's copyright business, (3) Official publications, (4) Copyright contributions to the library collections, (5) Administrative developments, (6) Legislative developments, (7) Judicial developments, and (8) International copyright developments. Extensive historical and current data are presented in tabular form. In addition, a list of publications available from the Library of Congress Copyright Office is provided. See LI 003 711 for the 1970 Annual Report of the Register of Copyrights. (SJ)

ED-063 957 Not available NTIS
Pilot Books, New York.
RECRUITING, TRAINING AND MOTIVATING VOLUNTEER WORKERS,
Arthur R. Pell. 1972, 60p
Available from Pilot Books, 347 Fifth Avenue, New York, N.Y. 10016 PC$2.59 postpaid.

Descriptors: (*Volunteers, *Recruitment), (*Volunteer training, *Personnel management), (*Personnel selection, Volunteers).

Some persons seek volunteer work actively and participate enthusiastically. Others have to be recruited and motivated to make them successful as volunteer workers. The purpose of this book is to guide the professional staffs and the volunteer leaders of the groups that provide opportunities for volunteers in the best techniques in the selection and utilization of this vast source of man/woman power. The author discussed where to find volunteers, how to attract them to volunteer work, how to interview, select and reject prospective workers, and how to place them within the organization. A formal training program and techniques for motivation and supervision of volunteers are described. Finally, the author looks at ways to adapt the modern techniques of behavioral science to the volunteer situation so that the leadership of organizations can get the same benefits from dealing with their volunteers that businesses obtain by using similar approaches with their staffs. (Author/SJ)

ED-063 958 Not available NTIS
Texas A and M Univ., College Station. Library.
AMERICAN UNIVERSITY LIBRARIES; ORGANIZATION AND ADMINISTRATION,
Edward G. Holley. 1971, 16p
Available from ERIC Document Reproduction Service, Bethesda, Md. 20014 PC$3.29, MF$0.65.

Descriptors: (*University libraries, Organization), (*Administration, *Staff role), (*Unions, Librarians).

At the beginning of the 1970s, American university libraries can look back upon a decade of phenomenal growth. Serious problems of organization and administration often resulted from this growth which have not received the attention deserved. The traditional hierarchial structure of university libraries with one head librarian at the top is no longer sufficient. Many librarians have recognized the need for a look at how libraries are organized and managed. Much of the investigation centers around three main points: (1) the need for greater staff involvement in library decision-making, (2) the need for some form of academic governance for professional staffs, and (3) the prospective unionization of library staffs. Whether through faculty governance, greater staff involvement on committees or other structures, or through unionization, the stress is upon staff involvement in library decisions. (Author/SJ)

ED-063 959 Not available NTIS
British Columbia Library Development Commission, Vancouver.
A PARTNERSHIP FOR DEVELOPMENT: PUBLIC LIBRARIES IN GREATER VANCOUVER,
Albert Bowron. 1971, 97p

Available from ERIC Document Reproduction Service, Bethesda, Md. 20014 PC$3.29, MF$0.65.

Descriptors: (*Public libraries, Foreign countries), (*School libraries, *Library cooperation), (*Library services, *Library planning), (*Library collections, Public libraries).
Identifiers: *Library development, Canada.

Deliberations of the Five Year Plan Committee in 1970 uncovered a need for a separate study on the organization of public libraries in the greater Vancouver area. The results of such a study, conducted in 1971, are contained in this report. Part I dwells on the details of the rapid growth of the Vancouver area in the hope that those responsible for library development will better understand the problems involved and will recognize the need for a system approach to public libraries as the only way to improve local service. Part II, a description of the Vancouver area political structure, is important for library development because of the key role of the Regional District form of government. Part III ANALYZES SOME ASPECTS OF LIBRARY SERVICE AND RELATES IT TO LOCAL AND NATIONAL, SOCIAL AND LIBRARY TRENDS. Parts IV, V and VI deal with special problems of the region while Part VII outlines a development plan designed to mesh with a similar plan for the rest of British Columbia being worked out by the Five Year Plan Committee. A list of 20 recommendations pertinent to each part of the report is presented. (Author/SJ)

ED-063 960 Not available NTIS
British Columbia Library Development Commission, Vancouver. Committee on Library Development.
A PROPOSAL FOR PROVINCE-WIDE ORGANIZATION OF LIBRARY SERVICES IN BRITISH COLUMBIA.
Dec 71, 55p
Available from ERIC Document Reproduction Service, Bethesda, Md. 20014 PC$3.29, MF$0.65.

Descriptors: (*Library services, *Foreign countries), (*Public libraries, *Decentralized library systems), (*Library standards, Library cooperation), (*Grants, Financial support).
Identifiers: *Canada.

Recommendations to the Library Development Commission to be used as a guide in planning a new program for library development are reported. The purpose of the publication is to elicit constructive comment and suggestions and to establish guidelines for province-wide organization of library services. Specific topics discussed include: public library systems, library system areas, library systems in metropolitan areas, standards for library systems, inter-library relationships, the Library Development Commission, provincial aid, library legislation, and priorities for the next five years. The report is concluded with a summary of recommendations. (Author/NH)

ED-063 961 Not available NTIS
British Columbia Library Development Commission, Vancouver.
LIBRARIES: VITAL TO TOMORROW'S WORLD; BRITISH COLUMBIA CENTENNIAL CITIZENS' CONFERENCE ON LIBRARIES HELD IN VICTORIA ON MAY 3, 1971.
1971, 47p
Available from ERIC Document Reproduction Service, Bethesda, Md. 20014 PC$3.29, MF$0.65.

Descriptors: (*Libraries, *Foreign countries), (*Conference reports, *Library services), (*Library cooperation, *Library planning).
Identifiers: *Canada.

The purpose of this meeting of an invited group of concerned citizens was to focus attention on the interrelation of all types of libraries in British Columbia. It was intended to involve those who pay for library service in a discussion of its potential to meet the demands of the coming generation. This record, which is not intended to be a 'proceedings', is intended as a means to continue the work of the meeting; to foster understanding and discussion of libraries in all parts of the province. It is hoped this document will serve as the voices of some citizens stimulating many others to discussion. Presentations included are: 'B.C. Libraries - Alone Today, Co-operating Tomorrow;' 'The Library, an Educational Force for the '70's;' 'The Regional District's Role in Library Development;' 'B.C.'s Tomorrow - The Future and The Challenge;' 'A Hard Look at Today - A Bold Look at Tomorrow;' and 'Where Its at - Where It Should Be.' A list of registered delegates to the meeting is included. (Author/NH)

ED-063 962 Not available NTIS
National Scientific and Technical Documentation Center, Djakarta (Indonesia).
DEVELOPMENT OF A NATIONAL DOCUMENTATION/INFORMATION SERVICES IN INDONESIA,
Harrison Bryan. 1972, 41p
Ford Foundation, New York.
Available from ERIC Document Reproduction Service, Bethesda, Md. 20014 PC$3.29, MF$0.65.

Descriptors: (*Information services, *Foreign countries), (*Documentation, *National programs), (*Information systems, Information centers).
Identifiers: *Indonesia, Scientific and Technical Information.

Included in this report on the development of national documentation/information centers in Indonesia are: (1) The identification of present documentation and information agencies, particularly those which have the capability of being developed into national centers for specific scientific fields; (2) The identification of the duties and functions of such national documentation/information centers; (3) The provision of a sketch that lays down the possible internal organization of such documentation/information centers and (4) The provision of policy and priorities for the development of such a national system of documentation/information centers. The list of recommendations resulting from the study is appended. (Author/NH)

ED-063 963 Not available NTIS
Tennessee Library Association, Nashville. Education Committee.
EDUCATION AND MANPOWER IN TENNESSEE LIBRARIES,
James E. Ward. 1971, 141p
Available from ERIC Document Reproduction Service, Bethesda, Md. 20014 PC$6.58, MF$0.65.

Descriptors: (*Librarians, *Manpower needs), (*Library surveys, Literature reviews), (*Library education, State programs), (*Public libraries, Special libraries), (*College libraries, University libraries).
Identifiers: *Tennessee.

All of the libraries in Tennessee were surveyed in an effort to determine both the manpower needs and the classification of all library personnel on the basis of the newly-adopted categories in the American Library Association (ALA) policy on library education and manpower. The purpose of the study was to reveal information pertinent to library educators for planning future programs in the state, to help library administrators utilize personnel more effectively, to aid the library profession in recruiting more sensibly, and to assist students in choosing and planning a career more wisely. It is hoped that this study in one state might be helpful, not only in supplying data which could have implications nationally, but could encourage other states to make similar studies in an effort to arrive at some reasonable solution to the so-called manpower problem in the library profession. All libraries in Tennessee were surveyed including public, school, special, and college and university libraries. One conclusion of this study is that there is no serious manpower shortage in Tennessee libraries insofar as 'filled positions' are concerned. (Author/NH)

ED-063 964 Not available NTIS
American Library Association, Chicago, Ill.
AMERICAN LIBRARY ASSOCIATION PROCEEDINGS OF THE MIDWINTER MEETING, HELD IN LOS ANGELES ON JANUARY 18-22, 1971 AND THE ANNUAL CONFERENCE, HELD IN DALLAS ON 20-26 JUNE 1971.
1971, 174p
Available from ERIC Document Reproduction Service, Bethesda, Md. 20014 PC$6.58, MF$0.65.

Descriptors: (*Library associations, Meetings).
Identifiers: *American Library Association.

Besides the proceedings of the American Library Association's (ALA) Midwinter Meeting and Annual Conference this publication contains: The executive director's report, the publishing board report, the division presidents' reports, the ALA committees reports, and the treasurer's report. (Author/NH)

ED-063 965 Not available NTIS
Ohio Coll. Library Center, Columbus.
STANDARDS FOR INPUT CATALOGING.
2 Jun 72, 28p
Available from ERIC Document Reproduction Service, Bethesda, Md. 20014 PC$3.29, MF$0.65.

Descriptors: (*Library standards, Cataloging), (*Library automation, Information processing), (*Library networks, Input output), (*Cataloging, Computers).

The member libraries of the Ohio College Library Center (OCLC) adopted standards for input cataloging in order to improve the technical processes while still keeping costs at a minimum. Increased compatibility of records input by different libraries so that records input by one could be more readily used by others was the final goal. It was decided that Library of Congress practice should be followed whenever possible, and that the Anglo-American Cataloging Rules should be used secondarily. Fields for which standards have been established are: bibliographic control numbers, knowledge numbers, main entry, supplied titles, title paragraph, physical description, series statement, bibliographic notes, subject added entries, other added entries, series added entries, and local fields. Standards for subfields within each field are presented. (SJ)

ED-063 966 Not available NTIS
Dalhousie Univ., Halifax (Nova Scotia). Library.
A BIBLIOGRAPHY FOR EXAMINATION OF FORMS OF TRAINING FOR SCIENTIFIC AND TECHNICAL WORK,
John Howard Oxley. Jan 72, 71p
National Research Council of Canada, Ottawa (Ontario).
Available from Dalhousie University Communications Services, Killam Library, Halifax, Nova Scotia PC$3.00.

Descriptors: (*Bibliographies, *Information science), (*Computer science, Bibliographies), (*Library science, Bibliographies), (*Documentation, Bibliographies), (*Information scientists, Educational programs), (*Librarians, Library education).

This bibliography is the result of an intensive search through all available indexing and abstracting sources in the fields of library science, information science, documentation and computer science. The purpose is to support an investigation into the nature of an information worker and provisions for his education. The basis of selection was either the direct or inferential concern of the article with some form of information work, some

type of personnel working in the information field, or with some aspect of the educational program directed at potential information workers. The bibliography is divided into two sections: the first, with addenda, represents those citations which in the opinion of the report author, contain useful material; while the second section represents ephemeral material or material not translated in a foreign language beyond the report author's competence. Although a few earlier articles are included, the earliest relevant articles cited date from 1945. Items cited are current to 1971. (Author/SJ)

ED-063 967 Not available NTIS
Tennessee Technological Univ., Cookeville.
LIBRARY STAFF NEEDS IN SOUTHERN APPALACHIAN SCHOOLS.
Final rept.,
Jerry B. Ayers. 31 May 72, 172p
Prepared in cooperation with Office of Education, Washington, D.C. National Center for Educational Research and Development.
Available from ERIC Document Reproduction Service, Bethesda, Md. 20014 PC$6.58, MF$0.65.

Descriptors: (*Instructional materials centers, School libraries), (*Librarians, *Employment projections), (*Library technicians, Employment projections), (*School aides, Employment projections).
Identifiers: *Southern Appalachian Region.

There is a shortage of trained personnel to man school media centers in the Southern Appalachian Region. In order to prepare a detailed plan to alleviate this shortage, there was an urgency to study the needs of the region for professional librarians and employees to assist these specialists. The purposes of this project were to determine the status and role of the librarian and library paraprofessionals and aides in the schools of the region and to determine future employment needs. Six survey instruments were prepared and administered to superintendents, supervisors, principals, librarians and paraprofessionals. Interviews were conducted with a sample of principals, librarians and paraprofessionals using a structured interview questionnaire and other individuals (State Library Supervisors, college personnel, etc), who were acquainted with the problems of the area. The results and conclusions of the study indicated that there is a need for additional professional and paraprofessional employees for the school libraries of the region. Administrators and librarians are very much interested in the expansion of existing programs, through the employment of additional personnel. The employment picture for the next ten years indicated an expanding job market for library personnel. (Author/SJ)

ED-063 968 Not available NTIS
United Nations Economic and Social Council, New York.
DEVELOPMENT OF INFORMATION MEDIA. BOOK DEVELOPMENT IN THE SERVICE OF EDUCATION.
4 Mar 71, 26p
Available from ERIC Document Reproduction Service, Bethesda, Md. 20014 PC$3.29, MF$0.65.

Descriptors: (*Communications, *Education), (*Books, Mass media), (*Textbooks, *Childrens books), (*Educational needs, International programs).

The application of new techniques of communication for the achievement of rapid progress in education, notably in the field of book development and, within its competence, in the field of space communications, are included in this report along with recommendations for action. The report deals with the role of books which, as a result of the revolution in production and distribution techniques, have become a powerful vehicle of mass communication in the development of education as understood in its broadest sense. It takes account, in particular, of the conclusions reached in the course of a series of regional meetings organized by UNESCO between 1966 and 1969 for the promotion of book production and distribution in developing countries. The report is divided into five sections: (1) Books in the world of 1970, general considerations; (2) Educational needs; (3) Meeting minimum needs; (4) Bottlenecks and (5) Conclusions and recommendations. (Author/NH)

ED-063 969 Not available NTIS
Louisiana State Library, Baton Rouge.
RESOURCES IN LOUISIANA LIBRARIES; PUBLIC, ACADEMIC, SPECIAL AND IN MEDIA CENTERS.
Report of a survey,
Sue Hefley. 1971, 173p
Prepared in cooperation with Office of Education, Washington, D.C.
Available from ERIC Document Reproduction Service, Bethesda, Md. 20014 PC$6.58, MF$0.65.

Descriptors: (*Library surveys, *Resources), (*Public libraries, *School libraries), (*Special libraries, *Instructional materials centers), (*Library services, Library programs), (*Library collections, Interlibrary loans).
Identifiers: *Louisiana.

The purpose of the survey was to compile a descriptive catalog detailing the strengths of Louisiana's library resources. The catalog should be a useful tool at all levels for interlibrary loan, patron referral, collection development, and for the identification of outstanding reference and bibliographical materials in academic, public, special libraries and in media centers serving schools at the administrative system level. The survey includes materials from all academic, public, special and administrative system-level media centers in Louisiana and analyzes library strengths identified by the participating libraries. The study is devoted primarily to printed materials. It does include descriptions of outstanding film and archival collections, but analyzes these materials only as far as the participating libraries have reported and described their collections. This report is a compilation of responses to the three questionnaires used in the survey. The libraries, state agencies and media centers to which survey questionnaires were sent are listed in alphabetical order. (Author/NH)

JPRS-57176 PC$3.00/MF$0.95
Joint Publications Research Service, Washington, D.C.
REFERENCE AID. ABBREVIATIONS IN THE MONGOLIAN PRESS.
4 Oct 72, 50p

Descriptors: (*Mongolia, *Abbreviations), Dictionaries.

The report contains a compilation of Cyrillic-lettered abbreviations commonly found in the Mongolian press. Included also are the Mongolian expansion and English rendition for each abbreviation. (Author)

N72-28706 PC$56.00/MF$0.95
National Academy of Sciences-national Research Council, Washington, D.C. Physics Survey Committee.
PHYSICS IN PERSPECTIVE, VOLUME I.
1972, 1080p NASA-CR-127703, LC-72-84752
Contract NSR 09-012-090

Descriptors: *Budgeting, *Physics, *Research, Cost estimates, Research facilities.

For abstract, see STAR 10 19.

N72-28932 PC$6.75/MF$0.95
University of Southern Calif., Los Angeles. Western Research Application Center.
ACTIVITIES OF WESTERN RESEARCH APPLICATION CENTER.
Annual Report
31 Jan 72, 94p NASA-CR-127565
Contract NASW-1869

Descriptors: *Information dissemination, *Nasa programs, *Technology transfer, Government/industry relations, Information management, Technology utilization.

For abstract, see STAR 10 19.

N72-28934 PC$5.75/MF$0.95
Southeastern State Coll., Durant, Okla. Technology Use Studies Center.
TECHNOLOGY UTILIZATION IN A NON-URBAN REGION FURTHER IMPACT AND TECHNIQUE OF THE TECHNOLOGY USE STUDIES CENTER (3).
Final Report
C. H. Gold, A. M. Moore, B. Dodd, and V. Dittmar. May 72, 75p NASA-CR-127437, AR-8
Contract NSR-37-004-009

Descriptors: *Information systems, *Technology utilization, Information dissemination, Management systems, Statistical analysis.

For abstract, see STAR 10 19.

N72-28935 PC$5.50/MF$0.95
North Carolina Science and Technology Research Center, Durham.
REGIONAL TECHNOLOGY TRANSFER PROGRAM.
Final Report, 1 Nov. 1970 - 31 Oct. 1971
31 Oct 71, 70p NASA-CR-124825
Contract NASW-2051

Descriptors: *Management information systems, *Technology utilization, Marketing, Product development, Search profiles, Technology transfer.

For abstract, see STAR 10 19.

N72-28936 PC$6.75/MF$0.95
Clingman (W. H.)and Co., Dallas, Tex.
INDEXING NASA PROGRAMS FOR TECHNOLOGY TRANSFER METHODS DEVELOPMENT AND FEASIBILITY.
Final Report
W. H. Clingman. 29 May 72, 94p
NASA-CR-127465
Contract NASW-2368

Descriptors: *Indexes, *Nasa programs, *Technology transfer, Documents, Methodology, Problem solving, Technology utilization.

For abstract, see STAR 10 19.

N72-28971 PC$3.00/MF$0.95
Pittsburgh Univ., Pa.
WHAT IS KASC .
1972, 12p NASA-CR-127472
Subm- Sponsored By Nasa

Descriptors: *Data retrieval, *Data systems, *Information retrieval, *Technology utilization, Information systems, Libraries, Selective dissemination of information.

For abstract, see STAR 10 19.

N72-28984 PC$21.75/MF$0.95
Bolt, Beranek, and Newman, Inc., Cambridge, Mass.
THE LUNAR SCIENCES NATURAL LANGUAGE INFORMATION SYSTEM.
Final Report
W. A. Woods, R. M. Kaplan, and B. Nash-webber. 15 Jun 72, 394p NASA-CR-127723, BBN-2378
Contract NAS9-1115

Subm- Prepared in Cooperation With Language Research Foundation, Cambridge, Mass.

Descriptors: *Information systems, *Language programming, *Lunar geology, Apollo flights, Chemical analysis, English language, Lunar rocks, Man machine systems.

For abstract, see STAR 10 19.

N72-29293 PC$8.00/MF$0.95
Boeing Co., Seattle, Wash. Computer Services.
NATURAL RESOURCE INFORMATION SYSTEM, REMOTE SENSING STUDIES.
Final Report
J. Leachtenauer, R. Hirsch, V. Williams, and R. Tucker. May 72, 116p NASA-CR-127809, USGS-DO-72-015
Subm- Sponsored By Bur. of Indian Affairs, Earth Resources Observation Systems Program, and Nasa

Descriptors: *Information systems, *Remote sensors, Earth resources program, Land use, Mapping, Photointerpretation.

For abstract, see STAR 10 20.

N72-29294 PC$3.75/MF$0.95
Boeing Co., Seattle, Wash. Computer Services.
NATURAL RESOURCE INFORMATION SYSTEM, DESIGN ANALYSIS.
Final Report
May 72, 31p NASA-CR-127810, USGS-DO-72-014
Subm- Sponsored By Bur. of Indian Affairs, Earth Resources Observation Systems and Nasa

Descriptors: *Information systems, *Maps, Computer programs, Data processing, Data storage, Earth resources.

For abstract, see STAR 10 20.

N72-29295 PC$5.00/MF$0.95
Boeing Co., Seattle, Wash. Computer Services.
NATURAL RESOURCE INFORMATION SYSTEM. VOLUME 1 OVERALL DESCRIPTION.
Apr 72, 58p NASA-CR-127812, USGS-DO-72-012-VOL-1
Contract K51C14200459
Subm- Sponsored Jointly By Nasa, Bur. of Indian Affairs, and Earth Resources Observation Systems Program Prepared for Bur. of Indian Affairs and Bur. of Land Management, Dept. of Interior

Descriptors: *Data processing, *Decision making, *Earth resources, *Information, *Land management, Aerial photography, Data storage, Display devices, Maps, Remote sensors.

For abstract, see STAR 10 20.

N72-29296 PC$5.00/MF$0.95
Boeing Co., Seattle, Wash. Computer Services.
NATURAL RESOURCE INFORMATION SYSTEM. VOLUME 2 SYSTEM OPERATING PROCEDURES AND INSTRUCTIONS.
Final Report
Apr 72, 57p NASA-CR-127811, USGS-DO-72-013-VOL-2
Subm- Sponsored By Nasa, Bur. of Indian Affairs, Earth Resources Observation Systems Program Prepared for Bur. of Indian Affairs and Bur. of Land Management, Dept. of Interior

Descriptors: *Data processing, *Earth resources, *Information systems, Computer graphics, Computer programs, Data systems, Digital techniques.

For abstract, see STAR 10 20.

N72-29846 PC$3.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
USEFUL NEW TECHNOLOGY.
1972, 17p

Descriptors: *Information dissemination, *Nasa programs, *Technology utilization, Aerospace engineering, Technology transfer.

For abstract, see STAR 10 20.

N72-29969 PC$6.00
National Aeronautics and Space Administration, Washington, D.C.
NASA PATENT ABSTRACTS BIBLIOGRAPHY A CONTINUING BIBLIOGRAPHY. SECTION 1 ABSTRACTS, JANUARY 1972.
Jan 72, 557p NASA-SP-7039-SECTION-1

Descriptors: *Abstracts, *Bibliographies, *Indexes, *Patents, Inventions, Product development, Technical writing.

For abstract, see STAR 10 20.

N72-29970 PC$6.00
National Aeronautics and Space Administration, Washington, D.C.
NASA PATENT ABSTRACTS BIBLIOGRAPHY A CONTINUING BIBLIOGRAPHY. SECTION 2 INDEXES, JANUARY 1972.
Jan 72, 331p NASA-SP-7039-SECTION-2

Descriptors: *Abstracts, *Bibliographies, *Indexes, *Patents, Inventions, Product development, Technical writing.

For abstract, see STAR 10 20.

N72-29972 PC$8.00/MF$0.95
George Washington Univ., Washington, D.C. Medical Center.
TECHNOLOGY APPLICATIONS.
Annual Report
T. Anuskiewicz, J. Johnston, W. Leavitt, and R. R. Zimmerman. May 72, 117p NASA-CR-127789
Contract NASW-2055

Descriptors: *Air pollution, *Fire prevention, *Nasa programs, *Technology transfer, *Technology utilization, Aerospace medicine, Law (jurisprudence), Medical services, Sociology.

For abstract, see STAR 10 20.

N72-29976 PC$3.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
INDEX TO NASA TECH BRIEFS, 1971.
Feb 72, 158p NASA-SP-5021 (12)

Descriptors: *Aerospace engineering, *Indexes (documentation), *Technology utilization, Information dissemination, Technology transfer.

For abstract, see STAR 10 20.

PB-212 460 PC$3.00/MF$0.95
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia).
CSIRO ABSTRACTS, VOLUME 20, NUMBER 6, 1972.
Jun 72, 115p
Abstracts of CSIRO published papers: translations. See also PB-212 460.

Descriptors: (*Research, *Abstracts), Genetics, Veterinary medicine, Animal husbandry, Soil mechanics, Atmosphere, Fisheries, Oceanography, Food, Horticulture, Minerals, Nutrition, Wildlife, Textiles, Translations, Australia.

The document contains abstracts, author index, and subject index.

PB-212 465 PC$3.00/MF$0.95
National Lending Library for Science and Technology, Boston Spa (England).
NLL ANNOUNCEMENT BULLETIN. A GUIDE TO BRITISH REPORTS, TRANSLATIONS AND THESES. VOLUME 2, NUMBER 8, AUGUST 1972.
Aug 72, 77p
See also PB-210 792.

Descriptors: (*Research, Bibliographies), Periodicals, Translations, Theses, Great Britain.
Identifiers: Announcement bulletins.

The NLL Announcement Bulletin lists British report literature and translations produced by British government organisations, industry, universities and learned institutions, as well as some doctoral theses accepted at British universities during and after 1970. All items listed are held by the NLL. (Author)

PB-212 466 PC$3.00/MF$0.95
National Lending Library for Science and Technology, Boston Spa (England).
NLL ANNOUNCEMENT BULLETIN. A GUIDE TO BRITISH REPORTS, TRANSLATIONS AND THESES. VOLUME 2, NUMBER 9, SEPTEMBER 1972.
Sep 72, 79p
See also PB-212 465.

Descriptors: (*Research, Bibliographies), Periodicals, Translations, Theses, Great Britain.
Identifiers: Announcement bulletins.

The NLL Announcement Bulletin lists British report literature and translations produced by British government organisations, industry, universities and learned institutions, as well as some doctoral theses accepted at British universities during and after 1970. All items listed are held by the NLL. (Author)

PB-212 486 PC$3.00/MF$0.95
National Lending Library for Science and Technology, Boston Spa (England).
LIST OF BOOKS RECEIVED FROM THE USSR AND TRANSLATED BOOKS.
Aug 72, 72p NLL-168
See also PB-211 406.

Descriptors: (*Books, Bibliographies), Research, Translations, USSR, Great Britain.

The list of books from the U.S.S.R. is arranged in broad subject groups, approximately in U.D.C. order, sub-divided by authors in the order of the Cyrillic alphabet. Translated Russian books are included as a separate section following the main part of the list, also in subject groups; sub-divided by authors in the order of the Roman alphabet. (Author)

PB-212 487 PC$5.25/MF$0.95
National Lending Library for Science and Technology, Boston Spa (England).
LIST OF BOOKS RECEIVED FROM THE USSR AND TRANSLATED BOOKS.
Sep 72, 62p NLL-169
See also PB-212 486.

Descriptors: (*Books, Bibliographies), Research, Translations, USSR, Great Britain.

The list of books from the U.S.S.R. is arranged in broad subject groups, approximately in U.D.C. order, sub-divided by authors in the order of the Cyrillic alphabet. Translated Russian books are included as a separate section following the main part of the list, also in subject groups; sub-divided by authors in the order of the Roman alphabet. (Author)

PB-212 508 PC$3.00/MF$0.95
National Lending Library for Science and Technology, Boston Spa (England).
INDEX OF CONFERENCE PROCEEDINGS RECEIVED BY THE NLL. CONFERENCE NUMBERS 72-03616-72-04121.
Jul 72, 35p NLL-58
See also PB-210 522.

Descriptors: (*Meetings, *Indexes (Documentation)), Bibliographies, Research, Proceedings, Subject index terms, Great Britain.

All types of conference proceedings are covered, including those which appear in serial form, those reporting individual conferences and published as books and those published as parts of normal serials. A list of subject keywords taken from the titles of the conference proceedings is included. (Author)

PB-212 509 PC$3.00/MF$0.95
National Lending Library for Science and Technology, Boston Spa (England).
INDEX OF CONFERENCE PROCEEDINGS RECEIVED BY THE NLL. CONFERENCE NUMBERS 72-04122-72-04784.
Aug 72, 43p NLL-59

Descriptors: (*Meetings, *Indexes (Documentation)), Bibliographies, Research, Proceedings, Subject index terms, Great Britain.

All types of conference proceedings are covered, including those which appear in serial form, those reporting individual conferences and published as books and those published as parts of normal serials. A list of subject keywords taken from the titles of the conference proceedings is included. (Author)

PB-212 510 PC$3.00/MF$0.95
National Lending Library for Science and Technology, Boston Spa (England).
INDEX OF CONFERENCE PROCEEDINGS RECEIVED BY THE NLL. CONFERENCE NUMBERS 72-04785-72-05176.
Sep 72, 29p NLL-60

Descriptors: (*Meetings, *Indexes (Documentation)), Bibliographies, Research, Proceedings, Subject index terms, Great Britain.

All types of conference proceedings are covered, including those which appear in serial form, those reporting individual conferences and published as books and those published as parts of normal serials. A list of subject keywords taken from the titles of the conference proceedings is included. (Author)

PB-212 547 PC$3.00/MF$0.95
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia).
CSIRO ABSTRACTS. VOLUME 20, NUMBER 9, SEPTEMBER 1972.
Sep 72, 88p
Abstracts of CSIRO published papers: translations. See also Volume 20, no. 8, PB-212 040.

Descriptors: (*Australia, Research), Abstracts, Animal husbandry, Animal physiology, Genetics, Chemistry, Atmosphere, Physics, Construction, Entomology, Fisheries, Oceanography, Food, Horticulture, Minerology, Soils, Textiles, Biochemistry, Radiobiology.

Contents:
Abstracts;
Author index;
Subject index;
Translations.

PB-212 553 PC$3.50/MF$0.95
Tampa Bay Regional Planning Council, St. Petersburg, Fla.
A STATEWIDE REGIONAL INFORMATION SYSTEMS NETWORK.
Memorandum rept.
Aug 72, 30p TBR-72-10-RIS-1

Descriptors: (*Information systems, Regional planning), (*Regional planning, *Florida), Data processing, Organizations, State government.
Identifiers: Tampa Bay (Florida).

The report describes the development of a statewide network of regional information systems for the State of Florida and outlines the strategies for implementing such a network. It addresses a set of requirements for data interchange and presents a conceptual configuration for a regional information system network. It stresses the need for system development coordination and recommends that organizations be developed to enhance and coordinate data interchange among Florida's regional planning groups, appropriate State agencies, and other organizations who have a need to participate in such a network. The long-range objective is to automate the interchange of data by means of a telecommunications network connecting all of the RIS and participating State agencies. (Author)

PB-212 628 PC$5.50/MF$0.95
Fairfax County, Va.
URBAN DEVELOPMENT INFORMATION SYSTEM.
Final rept. on Phases 1 and 2,
J. L. Hysom, Jr., S. D. Koop, W. B. Rucker, D. C. Green, and L. Leftoff. 15 Mar 72, 67p
Supersedes report dated 15 Jun 71, PB-202 992-U.

Descriptors: (*Information systems, *Urban planning), (*Land use, Information systems), Decision making, Virginia.
Identifiers: *Management information systems, UDIS (Urban Development Information Systems), Urban development information systems, Fairfax County (Virginia).

The Urban Development Information System (UDIS) provides a geographical reference to an accurate land parcel file which enables both public officials and private developers, as well as interested citizens, to monitor the on-going growth process in an urbanized area. The primary purpose of UDIS is to facilitate the process of decision-making as it relates to land use and urban planning. To county officials and to private builders, the system provides a reliable tool that will help officials direct the growth process. It will also assist the private development community in making financial decisions of great consequence that, in the past, have occasionally run contrary to the community's interest. (Author)

PB-212 643 PC$3.00/MF$0.95
Auerbach Associates, Inc., Philadelphia, Pa.
SCIENTIFIC INFORMATION SYSTEMS. TASK 1.
15 Jun 72, 104p AUER-2008-200-TR-1
Contract FDA-72-63
See also Task 2, PB-212 644.

Descriptors: (*Information systems, *Drugs), Documentation, Reviewing, Document circulation, Information retrieval.
Identifiers: Data bases, Bureau of Drugs.

The purpose of the report is to present the Bureau of Drugs with alternatives for development of a comprehensive Scientific Information System which will increase the professional reviewer's access to scientific information both in submissions under review as well as from drug-related documents previously submitted to FDA and external sources, such as the scientific literature. (Author)

PB-212 644 PC$3.00/MF$0.95
Auerbach Associates, Inc., Philadelphia, Pa.
MANAGEMENT INFORMATION SYSTEMS. TASK 2.
15 Jul 72, 95p AUER-2008-220-TR-2
Contract FDA-72-63
See also Task 1, PB-212 643 and Task 3, PB-212 645.

Descriptors: (*Information systems, *Drugs), Reviewing, Data processing.
Identifiers: *Management information systems, Bureau of Drugs, Data bases.

The report presents Bureau of Drugs with alternatives for development of a comprehensive system for management awareness of the status of IND/NDA submissions under review. (Author)

PB-212 645 PC$3.00/MF$0.95
Auerbach Associates, Inc., Philadelphia, Pa.
DOCUMENT CONTROL, MAINTENANCE AND RETRIEVAL. TASK 3.
1 Aug 72, 88p AUER-2008-200-TR-3
Contract FDA-72-63
See also Task 2, PB-212 644 and Task 4, PB-212 646.

Descriptors: (*Information systems, *Drugs), Data processing, Documentation, Document storage, Information retrieval.
Identifiers: Bureau of Drugs.

The report presents Bureau of Drugs with alternative methods of document control, maintenance, storage, and retrieval. The report does not include specific equipment to be used. (Author)

PB-212 646 PC$3.00/MF$0.95
Auerbach Associates, Inc., Philadelphia, Pa.
GUIDELINES ON THE NATURE AND FORMAT OF SUBMISSIONS. TASK 4.
15 Sep 72, 59p AUER-2008-200-TR-4
Contract FDA-72-63
See also Task 3, PB-212 645.

Descriptors: (*Information systems, *Drugs), Standards, Documents.
Identifiers: Bureau of Drugs, Format.

The report presents Bureau of Drugs with alternatives for guidelines in the nature and format of submissions to be used by sponsors in the preparation of IND's, NDA's, amendments, reports, and associated correspondence. (Author)

5C. Economics

AD-750 560 PC$14.75/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
ECONOMIC EFFECTIVENESS OF TECHNICAL SYSTEMS,
A. V. Glichev. 30 Jun 72, 351p Rept no. FTD-HT-23-913-72
Edited trans. of mono. Ekonomicheskaya Effektivnost Tekhnicheskikh Sistem, Moscow, 1971 p1-268, by Dean F. W. Koolbeck.

Descriptors: (*Economics, Mathematical models), (*Industrial production, Optimization), Scientific research, Efficiency, Decision making, Costs, Growth, Labor, Money, Wages, USSR.
Identifiers: Translations, Economic models, Economic analysis, Economic forecasting, Macroeconomics.

Contents:
Some problems in the methodology of investigating economic effectiveness;
Criterion for complex evaluation and the time factor;
Effectiveness of engineering systems and the technique of production and operation;
Methods for consolidated (approximate) calculations of expenditures for evaluating the effectiveness of engineering systems;
Dynamic model of the study of effectiveness of engineering systems;
Organization of economic investigations of engineering systems.

AD-750 632 MF$0.95
American Univ Washington D C Foreign Area Studies
AREA HANDBOOK FOR ROMANIA,
Eugene K. Keefe, Donald W. Bernier, Lyle E. Brenneman, William Giloane, and James M. Moore, Jr. 1972, 323p DA-PAM-550-160
Library of Congress catalog card no. 72-600095.
Availability: Paper copy available from GPO $2.75 as D2)25<<:DA-550-160.

Descriptors: (*Rumania, *Handbooks), Sociology, Political science, Economics, National defense, Geography, Language, Religion, Education, Law, Transportation, Communication systems, Armed forces (Foreign).
Identifiers: Area studies.

The handbook is a compilation of basic facts about the social, economic, political, and military institutions and practices of Romania. Topics covered include: Government, topography, climate, population, language, education, law, economy, agriculture, industry, foreign economic relations, finance, communications, transportation, armed forces, and international organizations.

AD-750 709 PC$3.00/MF$0.95
California Univ Berkeley Operations Research Center
SEMI-HOMOGENEOUS PRODUCTION FUNCTIONS AND SCALING OF PRODUCTION.
Research rept.,
Ronald W. Shephard. Sep 72, 38p Rept no. ORC-72-25
Contract N00014-69-A-0200-1010

Descriptors: (*Economics, Mathematical models), Convex sets, Functions, Vector spaces, Labor, Wages, Money, Costs, Theorems.
Identifiers: *Production functions, Scaling laws, Macroeconomics, Economic models, Graph theory.

COM-72-50965-03
PC-GPO/MF$0.95-NTIS
Department of Commerce, Washington, D.C.
COMMERCE TODAY. VOLUME 3, NUMBER 3.
13 Nov 72, 76p
Paper copy available from GPO $15.00/year as C1.58:3, $0.60/copy as C1.58:3/3.

Descriptors: (*Commerce, Reviews), (*Economic forecasting, *United States), (*International trade, *Poland), Credit, Populations, Cargo, Lumber, Census, Toxicity, Metals, Telecommunications, Waste disposal, Salmon, Patents, West Germany, Mexico, Belgium, Saudi Arabia.
Identifiers: *Minority owned enterprises.

Contents:
- U.S. business and economic status predicted to further expand in 1973;
- Technical and managerial assistance offered to minority entrepreneurs;
- U.S. and Poland sign trade accord;
- Domestic business report;
- Science and technology report;
- International commerce report.

PB-212 543 PC$7.00/MF$0.95
Indiana Dept. of Commerce, Indianapolis. Div. of Planning.
INDIANA - AN ECONOMIC PERSPECTIVE.
1972, 96p HUD-CPA-IN-05-00-0131-4

Descriptors: (*Indiana, *Economic surveys), Economic development, Populations, Industries, Urban areas, Rural areas.

The publication is an economic development study on the State of Indiana. It geographically compares relative strengths and weaknesses of each of the regions of the State and identifies the forces in each region which relate to its economic growth potential. It presents population by migration, age, sex and density. Industry is analyzed by agriculture, mining, construction, manufacturing, retail trade, wholesale trade, selected services, government services, utilities and financial services. There are also projections of population growth and economic goals. (Author)

PB-212 748 PC$3.00/MF$0.95
Yale Univ., New Haven, Conn. Economic Growth Center.
THE ROLE OF THE INDUSTRIAL SECTOR IN KOREA'S TRANSITION TO ECONOMIC MATURITY,
Gustav Ranis. Oct 71, 37p EGC-DP-125
TA/OST-AN-71-10-4
Contract AID/csd-2492

Descriptors: (*South Korea, *Economic development), (*Industries, South Korea), Developing countries, Economic analysis, Unskilled workers, Japan, Taiwan.

Korea belongs to the category of developing country which have small, therefore open, labor surplus dualistic economies, characterized by a relative lack of natural resources and an abundance of unskilled labor at the outset. This paper begins with a definition of the 'ideal' growth pattern for this type of economy. A review is then provided of the actual Korean experience relative to this ideal. Korean performance in this respect is contrasted to two other countries belonging to the same family; i.e. Japan, historically, and Taiwan in the post-war period. Consideration is given to the initial conditions and to the similarities and differences of the transition processes in the countries. Finally, the implications of this analysis with respect to further research and policy are discussed.

PB-212 749 PC$3.00/MF$0.95
Harvard Univ., Cambridge, Mass. Center for International Affairs.
EQUITABLE DISTRIBUTION OF BENEFITS IN INTEGRATION SCHEMES AMONG THE LESS DEVELOPED COUNTRIES: THE ANDEAN GROUP,
David Morawetz. Apr 72, 67p Economic Development-216 TA/OST-AN-72-4-3
Contract AID/cds-1543

Descriptors: (*Economic development, Treaties), (*Developing countries, *Distribution systems), Commerce, Inequalities, Agreements, Economic analysis, Bolivia, Chile, Colombia, Ecuador, Peru.
Identifiers: *Economic integration, Andean Group customs union.

All economic integration schemes among less developed countries which have been established to date have foundered on the problem of how to equitably distribute the benefits arising from hte existence of the scheme. The Cartagena Agreement of the Andean Group customs union (Bolivia, Chile, Colombia, Ecuador, and Peru) includes several measures bearing on this problem. The paper provides a theoretical analysis of the benefit distribution problem, and an evaluation of the benefit distribution provisions of the Cartagena Agreement. Consideration is given to the definition of an 'Equitable' benefit distritution, some problems in measuring net benefits, and the presumptions as to whether benefits are likely to be equally or unequally distributed in integration schemes. A number of schemes which have been proposed and/or adopted to achieve equitable benefit distribution are then examined from a theoretical viewpoint. The measures contained in the Cartagena Agreement are analyzed in the light of this examination, and of the experience of other integration schemes with the benefit distribution problem.

5D. History, Law, and Political Science

AD-750 619 PC$3.00/MF$0.95
Columbia Univ New York
THE NATURE OF MAINLAND CHINESE ECONOMIC STRUCTURE, LEADERSHIP AND POLICY (1949-1969) AND PROSPECTS FOR ARMS CONTROL AND DISARMAMENT. VOLUME I: SUMMARY.
Final rept.,
Richard Diao, and Donald Zagoria. Feb 72, 13p*
ACDA-E-124-Vol-1
Contract ACDA/E-124
See also Volume 2, AD-750 620.

Descriptors: (*Political Science, China), (*Arms control, Predictions), Leadership, Management planning, Organizations, Decision making, Arms control.
Identifiers: Government policies, Bureaucracies.

A review is made of the growth of bureaucracy in Red China, with particular regard to industrial programs and economic structure.

AD-750 620 PC$6.75/MF$0.95
Columbia Univ New York
THE NATURE OF MAINLAND CHINESE ECONOMIC STRUCTURE, LEADERSHIP AND POLICY (1949-1969) AND PROSPECTS FOR ARMS CONTROL AND DISARMAMENT. VOLUME II: BASIC REPORT.
Final rept.,
Richard Diao, and Donald Zagoria. Feb 72, 241p*
ACDA-E-124-Vol-2
Contract ACDA/E-124
See also Volume 1, AD-750 619.

Descriptors: (*Arms control, Predictions), (*Political science, China), Leadership, Industrial relations, Military psychology.
Identifiers: Government policies, Bureaucracies.

The Cultural Revolution has suspended all assumptions about the structure, operation and personnel of China's administrative system. However, the defense sector has not been disrupted to the degree found in other segments of the society. This suggests that no Chinese leadership will in the foreseeable future be interested in negotiating a comprehensive arms control agreement with the United States until such time when its strategic power becomes more nearly equal to that of the Soviet Union and the United States.

AD-750 621 PC$3.00/MF$0.95
Pittsburgh Univ Pa
THE IMPLICATIONS FOR ARMS CONTROL OF PERCEPTIONS OF STRATEGIC WEAPONS SYSTEMS. VOLUME I: SUMMARY,
J. I. Coffey, and Jerome Laulicht. Nov 71, 19p
ACDA-E-163-1
Contract ACDA/E-163
See also Volume 2, AD-750 622.

Descriptors: (*Strategic weapons, *Arms control), Nuclear weapons, Cost effectiveness, Guided missiles.

The purposes of this study were the following; To ascertain opinions prevalent among various groups in several countries concerning the political, psychological, economic, sociological, and scientific and technological values and costs of strategic weapons systems; To assess the implications of these views for the acceptability of measures to limit or reduce strategic offensive and defensive weapons; and, To explore the feasibility of an in-depth study of Soviet perceptions of the value and costs of strategic weapons systems.

AD-750 622 PC$3.00/MF$0.95
Pittsburgh Univ Pa

THE IMPLICATIONS FOR ARMS CONTROL OF PERCEPTIONS OF STRATEGIC WEAPONS SYSTEMS. VOLUME II: LITERATURE SURVEY,
Jerome Laulicht, and J. I. Coffey. Nov 71, 60p
ACDA-E-163-2
Contract ACDA/E-163
See also Volume 1, AD-750 621 and Volume 3, AD-750 623.

Descriptors: (*Strategic weapons, *Arms control), Nuclear weapons, Cost effectiveness, Guided missiles, Economics, Psychology, Sociology, Reviews.

The authors discuss the following: Examine the data to see whether the authors evaluated strategic weapons systems as valuable or costly; See into what categories (economic, political, psychological, sociological, or scientific and technological) the author's evaluations fell; See how the values or costs of strategic weapons systems are seen to affect the foreign policy, the domestic and the international environments; Discuss the important findings with respect to specific attributes in each of these categories, significant either because they were mentioned frequently or hardly at all; and, finally, examine views on weapons systems according to the nationality of the author and the country being discussed, with particular reference to the views of US and Soviet authors.

AD-750 623 PC$3.00/MF$0.95
Pittsburgh Univ Pa
THE IMPLICATIONS FOR ARMS CONTROL OF PERCEPTIONS OF STRATEGIC WEAPONS SYSTEMS. VOLUME III: STUDY OF SOVIET PERCEPTIONS,
Steven J. Rosen, and J. I. Coffey. Nov 71, 20p
ACDA-E-163-3
Contract ACDA/E-163
See also Volume 2, AD-750 622, and Volume 4, AD-750 624.

Descriptors: (*Strategic weapons, *Arms control), Nuclear weapons, Deterrence, USSR.

The purpose of this task, as defined in the contract is to 'make a brief survey of what is known of Soviet perceptions of values and costs of strategic weapons systems and explore the feasibility of an in-depth study of Soviet perceptions in this area in terms of methodology, personnel, cost.'

AD-750 624 PC$3.00/MF$0.95
Pittsburgh Univ Pa
THE IMPLICATIONS FOR ARMS CONTROL OF PERCEPTIONS OF STRATEGIC WEAPONS SYSTEMS. VOLUME IV: INTERVIEWS WITH EXPERTS,
Jerome Laulicht. Nov 71, 16p ACDA-E-163-4
Contract ACDA/E-163
See also Volume 3, AD-750 623, and Volume 5, AD-750 625.

Descriptors: (*Strategic weapons, *Arms control), Nuclear weapons, Cost effectiveness.

This part of the project called for interviewing present or former US government officials associated with weapons system development and deployment and experts in this area to determine their views about the costs and values of strategic weapons systems. This task, a modification of the agency's original terms of reference, was undertaken because a number of specific issues under study could not be adequately assessed without obtaining some original data. The only feasible way to partially fill this gap was to interview people similar to those whose publications were analyzed, asking the kinds of questions which we would have liked to ask of the writers, had they been present.

AD-750 625 PC$3.00/MF$0.95
Pittsburgh Univ Pa
THE IMPLICATIONS FOR ARMS CONTROL OF PERCEPTIONS OF STRATEGIC WEAPONS SYSTEMS. VOLUME V: POLLING DATA,
Jerome Laulicht. Nov 71, 40p ACDA-E-163-5
Contract ACDA/E-163
See also Volume 4, AD-750 624, and Volume 6, AD-750 626.

Descriptors: (*Strategic weapons, *Arms control), Nuclear weapons, public opinion, France, West Germany, Japan, United States.

The goal was to uncover 'perceptions of the political, economic, sociological, and psychological values and costs of strategic weapons systems.' The focus was on 'the views of various socio-economic-political groups in the United States, France, West Germany, and Japan, groups which are not experts on weapons systems and strategic concepts.' The original aim was to ascertain the relevant perceptions of the general public, as well as of such possible groups as national elites, business and professional men, academicians, government officials, union leaders and members, and farmers. A second aim was to assess changes (or lack of changes) in the perceptions of these groups over a five to ten year period, and to correlate such changes with perturbations in the international environment, to the extent that this was feasible. These inputs, together with those from other research, were to be used to assess the implications of these perceptions for arms control-the over-all purpose of the study.

AD-750 626 PC$3.00/MF$0.95
Pittsburgh Univ Pa
THE IMPLICATIONS FOR ARMS CONTROL OF PERCEPTIONS OF STRATEGIC WEAPONS SYSTEMS. VOLUME VI: INDEX,
Dorothea Carpenter. Nov 71, 10p ACDA-E-163-6
Contract ACDA/E-163
See also Volume 5, AD-750 625.

Descriptors: (*Strategic weapons, *Arms control), Indexes.

The report contains an index of terms used throughout the survey.

N72-30966 PC$10.50/MF$0.95
Ocean Data Systems, Inc., Rockville, Md.
IDENTIFICATION OF SPECIFIC REQUIREMENTS FOR A NASA AEROSPACE LAW INFORMATION SYSTEM AND IDENTIFICATION OF THE ACQUISITION REQUIREMENTS FOR AN AEROSPACE LAW COLLECTION FOR THE NASA LAW LIBRARY.
J. Morenoff, D. L. Roth, and J. W. Singleton. 15 Apr 72, 168p NASA-CR-127836
Contract NASW-2266

Descriptors: *Information systems, *Law (jurisprudence), *Libraries, *Nasa programs, Information retrieval, Space glossaries, Systems engineering, Tradeoffs.

For abstract, see STAR 10 21.

5E. Human Factors Engineering

N72-28091 PC$3.75/MF$0.95
Urs/Matrix Co., Huntsville, Ala. Man Systems Div.
DEVELOPMENT OF FLIGHT EXPERIMENT TASK REQUIREMENTS. VOLUME 1 SUMMARY.
Final Report
G. R. Hatterick. 1 Jun 72, 31p NASA-CR-127468, PRL-189-VOL-1
Contract NASW-2192

Descriptors: *Mission planning, *Space shuttle orbiters, *Spacecrews, Abilities, Experimental design, Human factors engineering, Task complexity.

For abstract, see STAR 10 19.

N72-28092 PC$11.75/MF$0.95
Urs/Matrix Co., Huntsville, Ala. Man Systems Div.
DEVELOPMENT OF FLIGHT EXPERIMENT TASK REQUIREMENTS. VOLUME 2 TECHNICAL REPORT. PART 1 PROGRAM REPORT AND APPENDICES A-G.
Final Report
G. R. Hatterick. 1 Jun 72, 194p NASA-CR-127469, PRL-189-VOL-2-PT-1
Contract NASW-2192

Descriptors: *Mission planning, *Space shuttle orbiters, *Spacecrews, Abilities, Experimental design, Human factors engineering, Task complexity.

For abstract, see STAR 10 19.

N72-29084 PC$9.75/MF$0.95
Michigan Univ., Ann Arbor. Engineering Human Performance Lab.
HUMAN STRENGTH SIMULATIONS FOR ONE AND TWO-HANDED TASKS IN ZERO GRAVITY.
Apr 72, 155p NASA-CR-115744
Contract NAS9-10973

Descriptors: *Biodynamics, *Bionics, *Hand (anatomy), *Muscular strength, *Weightlessness, Anthropometry, Bibliographies, Human factors engineering, Simulation.

For abstract, see STAR 10 20.

N72-30112 PC$3.00/MF$0.95
Stanford Research Inst., Menlo Park, Calif.
SIMULATED INDOOR SONIC BOOMS JUDGED RELATIVE TO NOISE FROM SUBSONIC AIRCRAFT.
K. D. Kryter, and J. S. Lukas. Aug 72, 20p
NASA-CR-2106
Contract NAS1-10017

Descriptors: *Aerodynamic noise, *Human reactions, *Noise intensity, *Sonic booms, Acoustic properties, Human factors engineering, Simulation.

For abstract, see STAR 10 21.

N72-30118 PC$4.50/MF$0.95
Toronto Univ. (Ontario). Inst. for Aerospace Studies.
THE EFFECT OF SECONDARY TASKS ON PILOT DESCRIBING FUNCTIONS IN A COMPENSATORY TRACKING TASK.
B. L. Watson. Jun 72, 48p UTIAS-178

Descriptors: *Compensatory tracking, *Human factors engineering, *Pilot performance, *Task complexity, Mathematical models, Mental performance, Statistical analysis.

For abstract, see STAR 10 21.

5G. Linguistics

JPRS-57177 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
BASIC DIRECTIONS OF APPLIED PSYCHOLINGUISTICS IN THE USSR,
A. A. Leontev. 4 Oct 72, 21p
Trans. of mono. Rechevoe Vozdeistvie Problemy Prikladnoi Psikholingvistiki, Moscow, 1972 p7-24.

Descriptors: (*Psycholinguistics, USSR), Reviews, Utilization.

The article reviews basic theoretical and applied problems in contemporary psycholinguistics, and investigates work being done in this field in the USSR and other countries. (Author)

PB-212 485 PC$6.00/MF$0.95
Harvard Univ., Cambridge, Mass. Aiken Computation Lab.
MATHEMATICAL LINQUISTICS AND AUTOMATIC TRANSLATION,
Susumu Kuno, and Jane Robinson. Jul 72, 381p
HARVU-AIK-NSF-28
See also PB-196 648.

Descriptors: (*English language, Transformational grammars), Syntax, Computational linguistics.

Contents:
Multiple wh questions;
Natural explanations for some syntactic universals;
Pronominalization and sloppy identity;
Centrality;
Delaware kinship terminology.

PB-212 622 PC$3.00/MF$0.95
Research Inst. of National Defence, Stockholm (Sweden).
SYNTAX AND DICTIONARY FOR A COMPUTER ENGLISH,
Jacob Palme. Jul 72, 68p FOA-P-C8312-M3 (E5)

Descriptors: (*English language, *Syntax), Analyzing, Dictionaries, Information retrieval, Sweden.

The report describes the syntax and dictionary which are used in the computer parsing of a simplified English for question answering. The parsing is the first step in the translation from English to the internal predicate calculus semantic network. The output of the parsing is a parsing tree, showing the surface syntactical structure of the parsed sentence. (Author)

5H. Man-Machine Relations

N72-28090 PC$12.25/MF$0.95
Bell Aerospace Co., Buffalo, N.Y.
TELEOPERATOR TECHNOLOGY AND SYSTEM DEVELOPMENT, VOLUME I.
Final Report, 1 Mar. 1971 - 28 Feb. 1972
Apr 72, 205p NASA-CR-123741,
REPT-8586-950001A-VOL-1
Contract NAS8-27021

Descriptors: *Display devices, *Systems engineering, *Teleoperators, Maintenance, Man machine systems, Manipulators.

For abstract, see STAR 10 19.

N72-28094 PC$8.25/MF$0.95
Cyberfacts, Inc., Sudbury, Mass.
DEVELOPMENT OF A MODEL OF MACHINE HAND EYE COORDINATION AND PROGRAM SPECIFICATIONS FOR A TOPOLOGICAL MACHINE VISION SYSTEM.
Final Report
30 Jun 72, 124p NASA-CR-127566
Contract NASW-2243

Descriptors: *Manipulators, *Programming languages, *Robots, *Vision, Remote control, Television systems, Viking mars program.

For abstract, see STAR 10 19.

N72-28109 PC$3.00/MF$0.95
Royal Aircraft Establishment, Farnborough (England).
REPRESENTATION BY MODELS OF THE BIOMECHANICAL SYSTEM MAN-OPERATOR UNDER THE ACTION OF RANDOM VIBRATIONS.
B. A. Potemkin, and K. V. Frolov. Jun 72, 9p
RAE-LIB-TRANS-1651, BR-29553
Tran- Transl. Into English From Dan (Ssar), V. 197, No. 6, 1971 P 1284-1287

Descriptors: *Dynamic characteristics, *Human body, *Man machine systems, *Random vibration, Autocorrelation, Biodynamics, Bionics, Vibration effects.

For abstract, see STAR 10 19.

5I. Personnel Selection, Training, and Evaluation

AD-750 603 PC$3.00/MF$0.95
Human Resources Research Organization Alexandria Va
PERFORMANCE IN FOUR ARMY JOBS BY MEN AT DIFFERENT APTITUDE (AFQT) LEVELS: 3. THE RELATIONSHIP OF (AFQT) AND JOB EXPERIENCE TO JOB PERFORMANCE.
Technical rept.,
Robert Vineberg, and Elaine N. Taylor. Aug 72, 151p Rept no. HUMRRO-TR-72-22
Contract DAHC19-70-C-0012
See also report dated Nov 70, AD-720 216.

Descriptors: (*Army personnel, Performance (Human)), Performance tests, Aptitude tests, Selection.
Identifiers: Marginal personnel.

To provide information on performance and characteristics of effective and ineffective marginal personnel in the Army, a study was made of approximately 1500 men with experience ranging up to 20 years in four different Army MOSs. The study included a group of men with Armed Forces Qualification Test scores in the marginal range and a comparison group of men in the same jobs, but in the upper AFQT levels. The report describes the bulk of the major study findings including comparisons of the performance of men in different mental categories with different amounts of job experience, comparisons of the performance of special subgroups (Negroes and Caucasians, inductees and enlistees, and men with formal and on-the-job training), an analysis and definition of acceptable performance, and a procedure for using job knowledge tests to screen ineffective performers. (Author)

AD-750 604 PC$3.00/MF$0.95
Human Resources Research Organization Alexandria Va
PERFORMANCE IN FOUR ARMY JOBS BY MEN AT DIFFERENT APTITUDE (AFQT) LEVELS: 4. RELATIONSHIPS BETWEEN PERFORMANCE CRITERIA.
Technical rept.,
Robert Vineberg, and Elaine N. Taylor. Aug 72, 39p Rept no. HUMRRO-TR072-23
Contract DAHC19-70-C-0012
See also report dated Aug 72, AD-750 603.

Descriptors: (*Army personnel, Performance (Human)), Standards, Performance tests.

A study was made of approximately 1800 men with experience ranging to 20 years in five different Army MOSs to provide information about the performance and characteristics of effective and ineffective marginal personnel in the Army. The study included a group of men with Armed Forces Qualification Test scores (AFQT) in the marginal range and a comparison group of men in the same jobs, but in the upper range of AFQT scores. Performance was measured by intensive job sample tests, job knowledge tests, and supervisor ratings. Biographical questionnaires, a battery of published and experimental tests, and Army records provided information about background, personal characteristics, and military experiences. The report examines the determinants of job behavior and describes the relationships among the three performance criteria used in the study: job sample tests, job knowledge tests, and supervisor ratings. (Author)

AD-750 616 PC$3.00/MF$0.95
Technische Universitaet Braunschweig (West Germany) Institut Fuer Maschinenelemante Und Foerdertechnik
EVALUATION OF A TRAINER FOR SENSOR OPERATORS ON GUNSHIP II AIRCRAFT.
Final rept.,
Bertran W. Cream. Sep 72, 53p AFHRL-TR-72-27

Descriptors: (*Infrared detectors, Operators (Personnel)), (*Training devices, *Tracking), (*Tactical air support, Performance (Human)), Army training, Design, Infrared equipment, Sensors, Simulators.
Identifiers: *Gunships, Aircraft modification.

The report describes the design, development and evaluation of a training device intended to enable ground based practice of equipment operation and target tracking skills that are required by the Forward Looking Infrared (FLIR) and Low Light Level TV (LLTV) sensor operators assigned to Gunship II aircraft. This trainer makes use of a relatively unique approach to tracking training by using video tape which is electronically manipulated so as to allow tracking in both simulated wide and narrow angle fields of views similar to actual equipment. In addition, the trainer incorporates both actual and mock-up instruments that enable the trainee to practice equipment procedures and malfunction isolation and correction. The evaluation of the training effectiveness of this device showed that sensor operators who received practice on this device reached the desired skill levels for both equipment pre-flight and target tracking sooner than those who had not received such training. (Author)

AD-750 683 PC$3.00/MF$0.95
Naval Personnel and Training Research Lab San Diego Calif
FIXED SEQUENCE AND MULTIPLE BRANCHING STRATEGIES IN COMPUTER ASSISTED INSTRUCTION.
Research rept.,
Dewey A. Slough, Burl D. Ellis, and George F. Lahey. Sep 72, 34p Rept no. SRR-73-6

Descriptors: (*Programmed instruction, *Electronics), Multiple operation, Sequences.
Identifiers: *Computer aided instruction, Branching instructional programming.

An experimental comparison was made between fixed sequence (FS) and branching versions of two CAI lessons in basic electronics. The FS versions provided minimum opportunities for branching. In contrast, the branching versions utilized a combination of branching applications, including bypassing of initial instruction, remedial branching, 'dual-control' practice, and optional review. Branching produced substantial savings in training time. Average times for the branching versions were 30% to 66% smaller than for the FS version. Branching was equally effective for students of high and low aptitude. Scatter plots and regression analysis indicated that average time savings were the same at all aptitude levels sampled. The number of branch frames taken was independent of aptitude. Branching increased the extent of individual differences in training time. (Author)

AD-750 684 PC$3.00/MF$0.95
Naval Personnel and Training Research Lab San Diego Calif
APPLICATIONS OF PRETEST BRANCHING DESIGNS TO CAI BASIC ELECTRONICS TRAINING.
Research rept.,
Richard E. Hurlock. Sep 72, 40p Rept no. SRR-73-8

Descriptors: (*Programmed instruction, *Electronics), Performance tests, Students.
Identifiers: Branching instructional programming, *Computer aided instruction.

The report presents results of development and evaluation of a computer assisted instruction (CAI) course module (capacitance) for basic electronics and includes the investigation of two pretest branching strategy designs intended to adapt instruction to meet individual training needs. Descriptions included: a new technique for coding lesson materials and student responses to facilitate and improve course revision, and tryout and revision cycles made during the developmental phase. The test and evaluation phase compared achievement and time measures of students trained on the previously developed CAI Inductance Module and the new CAI Capacitance Module with control students who received regular classroom instruction over the same training objectives. CAI lessons employing 'skip ahead' and 'minimal training' pretest branching designs provided the naive and slow learning student with 2 to 4 times more training than the sophisticated and fast learning student. (Author)

AD-750 694 PC$3.00/MF$0.95
Naval Training Equipment Center Orlando Fla
ANALYSIS OF UNDERWATER ACOUSTIC PROPAGATION LOSS MATH MODELS IN CURRENT TRAINING DEVICES.
Final rept.,
E. F. Meyer. Aug 72, 46p Rept no. NAVTRAEQUIPCEN-IH-200

Descriptors: (*Training devices, Sonar personnel), (*Underwater sound, Attenuation), Scattering, Mathematical models, Sound transmission, Computer programs.
Identifiers: AN/SQS-26, Ray tracing, FORTRAN 4 programming language, FORTRAN, Sigma 7 computers.

The report analyzes and compares the various simulation designs and math models of underwater acoustic simulation presently being used in current training devices developed by the Naval Training Device Center. The analysis contains model simplifications and their affects on acoustic propagation loss. The results of these models are compared with the results of the ray trace model developed by the Naval Air Development Center. (Author)

AD-750 748 PC$3.00/MF$0.95
Massachusetts Inst of Tech Lexington Lincoln Lab
THE LINCOLN TRAINING SYSTEM: A SUMMARY REPORT.
Technical note,
Robert C. Butman, and Frederick C. Frick. 3 Oct 72, 28p Rept no. TN-1972-26 ESD-TR-72-237
Contract F19628-73-C-0002, ARPA Order-2146

Descriptors: (*Training devices, *Microfiche), (*Programmed instruction, Cost effectiveness), Display systems, Input-output devices.
Identifiers: Lincoln training system, Visual aids, Computer aided instruction.

The report presents the current status of development of the Lincoln Training System. The LTS-3 is described in some detail together with the results of field evaluation and consideration of expected cost-effectiveness. (Author)

AD-750 761 PC$3.00/MF$0.95
Human Factors Research Inc Goleta Calif
ACTIVE SONAR TARGET DETECTION AND REPORTING: PERCEIVED CONSEQUENCES AND THEIR EFFECTS ON PERFORMANCE.
Technical rept.,
C. Dennis Wylie, and Robert R. Mackie. Jun 72, 176p Rept no. 1721-1
Contract N00014-71-C-0257

Descriptors: (*Sonar personnel, *Performance (Human)), Detection, Attitudes, Decision making, Sonar targets, Antisubmarine warfare.
Identifiers: Scenarios.

The objective of the research was to examine the effects of operational situations upon sonar operator's contact reporting behavior. An attitude survey involving fleet sonar operators and destroyer officers was conducted to determine the subjective values of five decision-making variables with respect to seventeen scenarios depicting peacetime and wartime tactical situations. It was found that sonar contact reporting thresholds were principally determined by the perceived consequences of missed contacts and of delay in contact reporting. it was also found that the assessments of false contact consequences were very inconsistent, unlike the judgments with respect to the other decision variables. the second phase of the research consisted of a sonar detection experiment, in which the influence of the variable 'command attention' on performance was measured to give an objective evaluation of the effects of psychological variables. (Author)

AD-750 774 PC$3.00/MF$0.95
System Development Corp Santa Monica Calif
DEVELOPMENT OF IMPROVED EMERGENCY OPERATIONS SIMULATION TRAINING (EOST) TRAINING PROCEDURES.
Final rept.,
Robert C. Harker. 31 Aug 72, 94p Rept no. SDC-TM-4954
Contract DAHC20-71-C-0288
Prepared in cooperation with Toyon Research and Investment, Inc.

Descriptors: (*Civil defense systems, *Training), (*Disasters, Training), Management planning, Simulation, Nuclear warfare.
Identifiers: EOST (Emergency Operations Simulation Training), Emergency operations simulation training.

The report presents procedures for the development of improved DCPA (Defense Civil Preparedness Agency) Emergency Operations Simulation Training (EOST) exercises conducted for local jurisdictions. The Research Directorate of DCPA is developing a set of Emergency Operating Planning Master Checklist documents relating to nuclear (NEOP) and natural (NADOP) disasters and covering zonal and areawide government operations. These documents are admirably suited to provide bases for local planning as they include recognition of damage from current estimates of nuclear attack capabilities and from natural disasters. Data are being developed for countermeasure actions relating to crisis buildup and warning periods as well as to post-attack recovery and remedial movement. The revised procedures for the improved EOST exercise program specifically include the use of the Master Checklist documents as the bases for the scenarios and message content of the exercises. (Author)

AD-750 846 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
A REVIEW AND ANALYSIS OF SYSTEM PROGRAM OFFICE MANAGER'S EXPERIENCE AND TRAINING, AND ITS RELATION WITH THE MAN-MACHINE CONCEPT.
Master's thesis,
Harold A. Solberg, and Charles J. Steiner. 15 Sep 72, 143p Rept no. SLSR-16-72B

Descriptors: (*Air force training, Analysis), (*Man-machine systems, Air force training), Military requirements, Professional personnel, Reviews, Theses.
Identifiers: *Managers.

The man-machine concept is frequently given insufficient emphasis during the development phase of the weapons acquisition process. This situation may be improved through training the Systems Program Office (SPO) Managers in man-machine concepts (in the USAF, the personnel subsystem). Prior to developing a training program, the background of present SPO directors and managers must be known. The report determines this background information through analysis of the computerized personnel records of SPO Managers assigned to the Aeronautical Systems Division at Wright-Patterson AFB. The report concludes that a training program is warranted, on the condition that the entire personnel subsystem element in the SPOs is re-emphasized by the Air Staff. (Author)

AD-750 850 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
MINUTEMAN COMBAT CREW INTEGRITY: ITS EFFECT ON JOB SATISFACTION AND JOB PERFORMANCE.
Master's thesis,
William Thomas McDaniel, and John R. Dodd. 15 Sep 72, 87p Rept no. SLSR-32-72

Descriptors: (*Guided missile personnel, *Personnel management), Guided missiles (Surface-to-surface), Strategic air command, Attitudes, Performance (Human).
Identifiers: *Job satisfaction, Minuteman.

The Strategic Air Command's policy of maintaining integral missile crews was evaluated. The specific purpose of the research was to determine the impact of this policy on job satisfaction and job performance in the Minuteman combat crew environment. Research data were collected via job attitude questionnaires, a crew performance records review and missile management interviews. Data analysis primarily involved the application of various statistical techniques. The authors concluded that the policy of crew integrity was a source of job dissatisfaction and had no significant effect on job performance. Further, it was recommended that the current policy be modified. (Author)

AD-750 906 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
DETERMINING THE EFFECTS OF THE ALL-VOLUNTEER SERVICE UPON THE ENLISTED LOGISTICS CAREER FIELDS.
Master's thesis,
Edward Berberek, Jr., and Harvey P. Weber, II. 20 Sep 72, 109p Rept no. SLSR-1-72B

Descriptors: (*Air force personnel, *Logistics), Recruiting, Standards, Predictions, Theses.
Identifiers: *All volunteer armed forces.

The proposed end to the draft in June, 1973, may result in the lowering, in terms of Airman Qualifying Examination (AQE) scores, of the quality of the entrants into the Air Force. The decrease in quality has been primarily attributed to the loss of those who have been under draft pressure and who have traditionally scored better on their AQE tests. There have been many studies and much written concerning the type of recruit that could be expected under the all-volunteer armed service. An analysis was made to determine if the quality of recruits in the logistics career fields will go down as some previous studies indicate. Those under no draft pressure will not now 'reluctantly volunteer' to enter the Air Force. The mean AQE score for the replacements of those not now 'reluctantly volunteering' was calculated. (Author)

AD-750 911 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
AN ANALYSIS OF MILITARY UNIONIZATION IN AUSTRIA, DENMARK, AND SWEDEN.
Master's thesis,
Joseph P. Mockaitis, and Donald E. Johnson. 20 Sep 72, 83p Rept no. SLSR-10-72B

Descriptors: (*Labor unions, *Military organizations), (*Armed forces (Foreign), Labor unions), Austria, Denmark, Sweden.
Identifiers: *Military labor unions.

The biggest labor union growth in recent years has been in the public sector of the United States economy. The traditional boundary for union activity in the public secotr has been the military. Even this boundary has been crossed in a number of foreign countries. There currently exists in the United States an extreme shortage of available information concerning military unions. Specifically, there is little information concerning organization, operation, advantages, disadvantages, and limitations of foreign military unions. The organization and operation of the present military unions of Austria, Denmark, and Sweden were analyzed to determine their advantages, disadvantages, and limitations. (Author)

AD-750 917 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
AN ANALYSIS OF THE RELATIONSHIP BETWEEN READABILITY OF AIR FORCE PROCEDURAL MANUALS AND DISCREPANCIES INVOLVING NON-COMPLIANCE WITH THE PROCEDURES.
Master's thesis,
Keith H. Johnson, Rogelio P. Relova, Jr., and Joseph P. Stafford. 15 Sep 72, 85p Rept no. SLSR-25-72B

Descriptors: (*Military publications, Reading), (*Instruction manuals, *Logistics), Performance (Human), Air force personnel, Human engineering, Correlation techniques, Theses.
Identifiers: *Readability.

Readability of Air Force logistics procedural manuals is generally too high for their readers. The readers, from different Air Force Specialties (AFS), are faced with a readability/reading ability gap when using the procedural manuals. This 'gap' was found to correlate directly with the frequency of discrepancies actually found over a two year period by Air Defense Command (ADC) Headquarters Inspector General's Staff. Additionally, USAF manuals in the 66-, 67-, 70-, 75-, series were tested for readability using the Fog Count method. Mean readability was 17th grade (95% one side confidence interval), with a standard deviation of 4.5 grades (95% one sided confidence interval). Recommendations for action to correct the problem areas found by the study are included. (Author)

AD-750 965 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
ON THE TRAINING OF RADIO AND COMMUNICATIONS ENGINEERS IN THE DECADES OF THE IMMEDIATE FUTURE,
I. G. Klyatskin. 25 Aug 72, 9p Rept no. FTD-HC-23-0809-72
Unedited rough draft trans. of Trudy Uchebnykh Institutov Svyazi (USSR) n50 p5-9 1970.

Descriptors: (*Training, *Engineering personnel), Radio communication systems, Electronics, USSR.
Identifiers: Translations.

The article contains changes required in the training program for radio and communications engineers to enable them to perform in accordance with radical changes that will occur in radio electronics. (Author)

AD-750 979 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
USE OF FUELS AND LUBRICANTS REQUIRES SPECIALIZED PERSONNEL,
J. Vercon. 14 Aug 72, 13p Rept no. FTD-HC-23-0623-72
Unedited rough draft trans. of Tekhnika Podmazivanya i Primena Goriva (USSR) v10 n2 p3-11 1971.

Descriptors: (*Fuels, *USSR), (*Lubricants, USSR), (*Technicians, Education), Fuel Additives, Combustion, Lubrication, Internal combustion engines, Scientific research, Chemical properties.
Identifiers: Tribology, Translations.

The field of application of fuels and lubricants requires the training of experts of various levels. At least two kinds of specialization are necessary: the application of liquid and gaseous fuels as a separate field of thermotechnics and motorism as well as tribology and the technique of lubrication. The author describes the condition of such development in some European countries. Numerous institutes and laboratories for tribology and for the application of fuels were founded in the last few years usually with universities and advanced engineering schools as well as in oil and motor industry. (Author)

AD-751 020 PC$3.00/MF$0.95
Naval Personnel and Training Research Lab San Diego Calif
SOURCES OF JOB SATISFACTION AND DISSATISFACTION AMONG NAVY NURSES.
Final rept.,
Joyce E. Dann. Sep 72, 49p Rept no. SRR-73-10

Descriptors: (*Nurses, *Personnel management), (*Naval personnel, Nurses), Attitudes, Attrition, Job analysis.
Identifiers: *Job satisfaction, *Navy nurses.

The proportion of Navy nurses who remain in the Nurse Corps after completing their obligated service has been relatively small. An increase in retention would be expected if Navy nursing could be made more rewarding by identifying and removing causes of dissatisfaction. The study sought to determine sources of job satisfaction and dissatisfaction among Navy nurses and to identify areas where constructive changes in the Nurse Corps might be made. Aspects considered most attractive by nurses in the total sample included interpersonal relations, travel, achievement, the work itself, and security and fringe benefits. Aspects considered least attractive were hospital policy and administration, Nurse Corps policy and administration, non-nursing duties, and supervision. Suggestions for change were most often in the areas of Nurse Corps policy and administration, hospital policy and administration, job duties, supervision, and achievement opportunities. (Author)

PB-212 562 PC$3.00/MF$0.95
North Star Research and Development Inst., Minneapolis, Minn.
A SURVEY OF RECENT LITERATURE RELEVANT TO OPTIMIZING THE BENEFITS OF YOUTH PROJECTS FOR RURAL YOUTH IN THE SOUTHEASTERN STATES.
Final rept.,
Barbara M. Rogoff, William J. Schneider, and Guy H. Miles. Aug 72, 58p* DLMA-41-2-001-27
Contract DL-41-2-001-27

Descriptors: (*Youths, Rural areas), (*Socioeconomic status, *Southern states), Reviews, Demographic surveys, Economic surveys, Ethnic groups, Employment, Adjustment (Psychology), Hypotheses, Population migrations, Social change, Education, Industrial training, Manpower utilization, Projects, Evaluation, Statistical data, Optimization.
Identifiers: Benefits.

A review was made of more than 140 publications which deal with the occupational and social adjustment of rural youths in the Southeastern region. This review focuses on publications that concern the changing economic environment of rural youths, their migration patterns, their educational system, their participation in federal manpower programs, and their occupational and social adjustment.

PB-212 566 PC$6.00/MF$0.95
Texas Univ., Austin. Center for the Study of Human Resources.
RURAL INDUSTRIALIZATION AND SOUTHERN RURAL POVERTY IN THE 1960'S: PATTERNS OF LABOR DEMAND IN SOUTHERN NOMETROPOLITAN LABOR MARKETS AND THEIR IMPACT ON LOCAL POVERTY,
Thomas E. Till. Aug 72, 325p OEO-LN-1200
Contract OEO-CG-6994

Descriptors: (*Labor estimates, *Southern states), (*Rural areas, *Manpower studies), Economic surveys, Impact, Manpower utilization, Employment, Demand (Economics), Factor analysis, Mathematical models.
Identifiers: Input output models, *Poverty, County summaries.

A study is reported of employment conditions and relations in Southern nometropolitan counties.

PB-212 626 PC$3.00/MF$0.95
Nathan (Robert R.), Associates, Inc., Washington, D.C.
PROJECT VEHTS (VERSATILE EMPLOYMENT OF HEALTH-TRAINED SERVICEMEN).
Interim rept. no. 1, Jul 71-Jun 72.
Jun 72, 90p DLMA-82-11-71-42-1
Contract DL-82-11-71-42
Report on Project to Assist Civilian Hospitals in Hiring and Retaining Military-Trained Medical Personnel.

Descriptors: (*Medical personnel, *Employment), (*Hospitals, Manpower utilization), Placement, Military personnel, Recruiting.
Identifiers: VEHTS (Versatile Employment of Health Trained Servicemen), Versatile employment of health trained servicemen, *Veterans.

Project VEHTS - Versatile Employment of Health-Trained Servicemen - is demonstrating how civilian hospitals can employ and use more effectively the thousands of medically trained servicemen who are released each year by the Armed Forces. A system of recruitment and placement of veterans at Cook County Hospital Chicago, Illinois was designed and implemented. A literature and program search was conducted; an annotated bibliography is presented as an appendix to the report. Project VEHTS has identified two major problems that civilian hospitals have in recruiting and placing veterans. The first arises out of the characteristics of military men, particularly their nontraditional and nonaccredited training and experience and their geographic dispersion. The second develops out of organizational and management characteristics of civilian hospitals, especially from their personnel systems which result in diffused hiring authority and inefficient use of veteran manpower. (Author)

PB-212 669 PC-GPO/MF$0.95-NTIS
Bureau of Labor Statistics, Washington, D.C.
INDUSTRY WAGE SURVEY: MACHINERY MANUFACTURING, WINTER 1970-71.
Final rept.
1972, 69P DOL-BLS-B-1754
Paper copy available from GPO $1.00 as L2.3: 1754.

Descriptors: (*Wage surveys, Tables (Data)), Machinery, Manufacturing.

A summary is given of wages and supplementary benefits of all production and related workers in selected occupations in the machinery manufacturing industry for the period 1970/71. Data are shown for the United States as a whole and for selected regions and metropolitan areas. (Author)

PB-212 690 PC$3.00/MF$0.95
Wisconsin Univ., Madison. Graduate School of Business Administration.

A STUDY OF THE LOCAL JOB BANK PROGRAM: PERFORMANCE, STRUCTURE, AND DIRECTION.
Monograph no. 5,
George P. Huber, and Joseph C. Ullman. Aug 72, 270p DLMA-71-53-70-01
Contract DL-71-53-70-01
Prepared in cooperation with Purdue Univ., Lafayette, Ind. Krannert School of Industrial Administration. Sponsored in part by Brookings Inst., Washington, D.C.

Descriptors: (*Manpower utilization, *Urban planning), (*Labor, Management planning), (*Projects, Evaluation), Organizations, Effectiveness, Feedback, Employment, Standards, Management, Recommendations, Federal budgets, Socioeconomic status.
Identifiers: *Job banks, Low income groups.

There were three purposes of the research. One was to determine the relative goal achievement of local job banks. The second was to determine the optimal organizational design configuration of job banks. The third was to determine the impact of feedback of results and recommendations related to the first two purposes, on the direction and structure of the program.

PB-212 719 PC$3.00/MF$0.95
New Mexico State Univ., University Park. Water Resources Research Inst.
SCHOOL LEARNING MATERIALS ON WATER PROBLEMS OF NEW MEXICO AND THE SOUTHWEST.
Technical completion rept.,
Chris Buethe, and Alan Fitzpatrick. Oct 72, 23p
WRRI-010 W73-00939, OWRR-A-031-NMEX (1)

Descriptors: (*Education, Water supply), (*Water supply, *New Mexico), Attitudes, Water pollution, Irrigation, Salinity, Demand (Economics), Land use, Water rights.
Identifiers: Mediated learning materials, Water problems.

Schools typically make no special efforts to prepare students to cope with present and anticipated water problems. The objective of this study was to prepare a set of mediated learning packages based upon water problems of New Mexico and the dry regions of the Southwest. These learning materials were prepared and field tested for use at three levels: Elementary (grades 3-6), Secondary (grades 7-12), and Adult (teachers and mature students). Each learning package was composed of a set of color slides, an accompanying tape recording, a copy of the tape script, and suggestions for educational use. (Author)

PB-212 762 PC$3.00/MF$0.95
National League of Cities, Washington, D.C.
SCIENCE AND TECHNOLOGY FOR THE CITIES.
Final rept.,
John Feild. Jul 72, 120p*
Contract NSF-GT-28

Descriptors: (*Manpower utilization, *Urban planning), (*Professional personnel, *Transfer of training), (*Unemployment, *Government policies), Project planning, Employment, Scientists, Engineers, Surveys, Questionnaires, Local government, Placement.
Identifiers: *Displaced professional personnel, Research and development programs, Los Angeles (California), New Orleans (Louisiana), New York (New York).

A study is reported of the potential for utilization of scientific and technical personnel by local governments. Five major areas are covered: (1) local government's ability to re-employ former aerospace and defense professionals; (2) local research and development programs that could be expanded or supplemented; (3) the market for local government research and development based on five-year projections of expenditures and needs; (4) improving relationships local governments have with consulting engineers and equipment manufacturers that would enhance the use of new scientific and technical discoveries; and (5) relationships among Federal, state and local governments in the areas of science policy and services.

5J. Psychology (Individual and Group Behavior)

AD-750 407 PC$3.00/MF$0.95
Naval Air Development Center Warminster Pa Systems Analysis and Engineering Dept
EVALUATION OF TACTICAL COST.
Phase rept.,
David F. Gould. 18 Apr 72, 12p Rept no. NADC-72061-SD

Descriptors: (*Decision making, Armed Forces operations), Systems engineering, Logistics, Mission profiles, Advanced planning, Costs.
Identifiers: *Tactical cost.

A procedure is given for the evaluation of tactical cost. Tactical cost, often a component of utility in decision making, is, briefly, the value of what is given up as a result of adopting a specific course of action. (Author)

AD-750 583 PC$3.00/MF$0.95
Army Medical Research Lab Fort Knox Ky
THE CONTINGENCY MODEL: SOME IMPLICATIONS OF ITS STATISTICAL AND METHODOLOGICAL PROPERTIES.
Interim rept.,
Samuel C. Shiflett. 17 Aug 72, 26p Rept no. USAMRL-956

Descriptors: (*Leadership, Effectiveness), Mathematical models, Group dynamics, Correlation techniques.
Identifiers: Contingency.

The statistical and methodological adequacy of several aspects of Fiedler's (1967) contingency model of leadership effectiveness is considered. It is suggested that the use of rank order correlations, instead of product moment correlations, produces distortions related to sample size. LPC (least preferred coworker) is shown to be a reasonable predictor of group performance. But the model implies that LPC is unrelated to group performance under some conditions of situational favorableness. Problems with a multidimensional interpretation of LPC and a unidimensional interpretation of situational favorableness are discussed. Problems of research strategies used to test and validate the model are considered in terms of sample size, inclusion of non-significant results, the difficulty involved in adequately testing higher order interactions, and the inability to make between-octant comparisons. It was concluded that the model is capable of directing meaningful research as long as traditional research procedures designed to safeguard internal and external validity are carefully exercised. (Author)

AD-750 651 PC$3.00/MF$0.95
Naval Submarine Medical Research Lab Groton Conn
EFFECT OF PERSONAL TREATMENT OF NAVY SUBJECTS ON A HEARING DISCRIMINATION TASK.
Medical research progress rept. no. 6,
Robert O. Brown, and C. K. Myers. 14 Mar 72, 11p Rept no. NAVSUBMEDRSCHLAB-704

Descriptors: (*Psychoacoustics, Motivation), (*Audiometry, *Speech recognition), Performance (Human), Behavior, Hearing, Attitudes, Attention, Naval personnel.

Two groups of Navy enlisted men, 20 in each group, performed on a speech reception task at low intensity levels. The Ss of one group were handled circumspectly, appraised of their progress and run during duty time. The Ss of another group were treated in a formal manner, were not informed of progress and were run during free time with the possibility of missing a meal. The difference between the groups' mean scores was not significant at the .05 level. Debriefing interviews suggest that the results may reflect an adaptation to degrees of impersonal treatment occasionally present in military personnel interaction. (Author)

N72-28062 PC$3.75/MF$0.95
Royal Aircraft Establishment, Farnborough (England).
THE CRISIS OF SIGNIFICANCE TESTS IN PSYCHOLOGY.
G. Kleiter. Jun 72, 32p RAE-LIB-TRANS-1649, BR-29646
Tran- Transl. Into English From Jahrb. Psychotherapie Und Med. Anthropol., (West Germany), No. 17, 1969 P 144-163

Descriptors: *Mathematical logic, *Psychological tests, *Statistical tests, Bayes theorem, Data correlation, Null hypothesis.

For abstract, see STAR 10 19.

N72-28697 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
RELATIONS AMONG PURE-TONE SOUND STIMULI, NEURAL ACTIVITY, AND THE LOUDNESS SENSATION.
W. L. Howes. Jul 72, 34p NASA-TN-D-6889, E-6598

Descriptors: *Auditory stimuli, *Loudness, *Psychoacoustics, Electrophysiology, Physiological responses, Sound intensity, Sound pressure, Thresholds (perception).

For abstract, see STAR 10 19.

N72-29049 PC$3.00/MF$0.95
Bryn Mawr Coll., Pa.
STIMULUS CONTROL IN PIGEONS AFTER EXTENDED DISCRIMINATIVE TRAINING.
M. Yarczower. 1972, 15p NASA-CR-127772
Contract NGR-39-018-002

Descriptors: *Conditioning (learning), *Discrimination, *Pigeons, *Stimuli, Inhibition (psychology), Learning curves.

For abstract, see STAR 10 20.

5K. Sociology

AD-750 685 PC$3.00/MF$0.95
Naval Personnel Research and Development Lab Washington D C
AN ASSESSMENT OF A NEW SYSTEM FOR ANNUAL ADMINISTRATION OF THE FAMILY HOUSING SURVEY.
Final rept.,
L. A. Broedling. Sep 72, 58p Rept no. WTR-73-7

Descriptors: (*Housing, *Questionnaires), (*Naval personnel, Housing), Optical scanning, Management planning, Feasibility studies.

The study involved the development and evaluation of a new system for annual administration of the family housing survey. The Naval Facilities Engineering Command is responsible for coordinating an annual survey of family housing which is used to determine military family housing requirements. The present survey system uses questionnaires which must be keypunched. These questionnaires are administered by monitors at group sessions. This system is both time-consum-

ing and costly. The new system involves use of a questionnaire which is suitable for optical scanning and the questionnaires are self-administered. The new system was tested in conjunction with the CY 71 and CY 72 surveys at selected test locations. The results showed that the new system is feasible to use for the survey. A cost analysis showed the new system to be much more efficient than the present one. An inquiry of survey personnel indicated that, in terms of administrative efficacy, they regarded the new system to be superior. (Author)

N72-29689 PC$8.25/MF$0.95
National Academy of Sciences-national Research Council, Washington, D.C. Physics Survey Committee.
PHYSICS IN PERSPECTIVE RECOMMENDATIONS AND PROGRAM EMPHASES.
1972, 125p NASA-CR-127782
Contract NSR-09-012-090

Descriptors: *Education, *Financial management, *Physics, *Research management, Federal budgets, Research projects, Schools, Universities.

For abstract, see STAR 10 20.

PB-212 591 PC$4.50/MF$0.95
Utah Univ., Salt Lake City. Dept. of Psychology.
THE CONTROL OF SHOPLIFTING: MODEL CHARACTERISTICS AND RESPONSE CONTINGENCIES AS DETERMINANTS OF BYSTANDER INTERVENTION.
Final rept. 1 Jul 70-1 Oct 71,
Donald M. Gelfand, Donald P. Hartmann, Patrice Walder, and Brent Page. 1 Oct 71, 65p* LEAA-NI-70-065-PG-14

Descriptors: (*Criminal investigations, *Public opinion), Crimes, Commercial buildings, Law enforcement, Human behavior, Control.
Identifiers: *Shoplifting, *Bystander response.

The purpose of the study was to investigate shoplifters and to observe bystander characteristics and other factors related to the reporting or non-reporting of shoplifting. Shoplifting incidents were staged in a low income area drug variety store. In each case the 'shoplifter' was the same young woman college student. In half the cases she wore conventional clothing and in the other half of the cases she wore 'hippie' garb. The shoplifting incident was staged so that only one shopper would be in the vicinity of and be able to see the incident. Observers were varied by age, sex, and socio-economic status. Incidents were video taped and subjects were interviewed about whether or not they saw the incident and why they did or did not report it. (Author)

PB-212 593 PC$3.00/MF$0.95
Wyoming Recreation Commission, Cheyenne.
AN OUTDOOR RECREATION PLAN FOR WYOMING. VOLUME II, APPENDICES.
Report for Oct 70-Mar 73,
Clynn Phillips, and Dwight M. Blood. Oct 70, 151p WRC-10-1970-Vol-2
See also report dated Oct 70, PB-203 151.

Descriptors: (*Recreational facilities, *Economic surveys), (*Regional planning, *Wyoming), Project planning, Classifications, Statistical data, Mathematical prediction, Inventories, Legislation.
Identifiers: *Outdoor recreation.

Volume 2 contains the session laws of Wyoming, a projection of socioeconomic variables, statistical data on estimated resident participation in selected outdoor recreation activities by county for 1967, an estimation of the number of out-of-state visitor participants, an adjustment of projected county participation data by socioeconomic and geographic indices, the projected out-of-state participation for 1985, and inventories of natural resources and facilities.

PB-212 614 PC$6.00/MF$0.95
International Association of Chiefs of Police, Inc., Gaithersburg, Md. Highway Safety Div.
SELECTIVE TRAFFIC ENFORCEMENT MANUAL.
Final rept.,
William H. Franey, Norman Darwick, and Frank D. Roberson. Jan 72, 182p* DOT-HS-800 701
Contract DOT-HS-036-2-226

Descriptors: (*Law enforcement, *Traffic safety), (*Police, *Job analysis), Manuals, Personnel management, Motor vehicle accidents, Accident investigations, Selectivity.

Selective enforcement is that part of a traffic safety program which involves the planning, directing, implementing and evaluating of traffic law enforcement activity. The ultimate goal of selective enforcement is to reduce traffic accidents by systematically improving the manner in which available police manpower and equipment resources are used. The manual describes elements, standards, implementation, and manpower allocation of selective enforcement.

PB-212 664 PC$5.00/MF$0.95
Girard City Planning Commission, Ohio.
POPULATION ANALYSIS. GENERAL DEVELOPMENT PLAN-1971. GIRARD, OHIO.
E. Gordon McLean. Dec 71, 59p
Prepared in cooperation with Mosure-Fok and Syrakis Co., Ltd., Youngstown, Ohio.

Descriptors: (*Demography, *Ohio), (*Populations, Statistical analysis), Community relations, Economic factors, Labor relations, Mathematical prediction, Urban planning.
Identifiers: *Girard (Ohio), Satellite communities.

The city of Girard, Ohio, as part of the Youngstown-Warren SMSA, has the role of a satellite community, with its major function of supply the labor force to the Mahoning Valley industrial activity. Population data was attained from the 1970 U.S. census and other sources. Population projections are based on a modification of the Cohart-Survival method.

PB-212 701 PC$3.00/MF$0.95
Committee on Law Enforcement and Administration of Criminal Justice, Boston, Mass.
COMPREHENSIVE CRIMINAL JUSTICE PLAN - 1972: PROGRAM DESCRIPTIONS.
Final rept.
1972, 78P LEAA-NI-72A-225
Contract LEAA-NI-72A-225

Descriptors: (*Criminology, *Massachusetts), Police, Juvenile delinquency, Telecommunications, Law enforcement, Community relations, Urban areas, Crimes, Drugs, Alcohols.
Identifiers: *Criminal justice, Courts of law.

The report is a continuation, consolidation and expansion of programs begun in past years combined with several new efforts to implement substantial improvement in the Massachusetts' criminal justice system. The eight main divisions of the report are: Police, courts, corrections, juvenile delinquency, drugs/alcohol, engineering and resources. The focus for this year's report as outlined in the Plan include 4 areas. These are: Large cities program; corrections; communications improvement program; introduction of new types of personnel criminal justice system. (Author)

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-750 346 PC$3.00/MF$0.95
Walter Reed Army Medical Center Washington D C Army Medical Biomechanical Research Lab
A UNIFIED MECHANISM FOR THE PROCESS OF CALCIFICATION IN HARD AND SOFT TISSUES,
Fred Leonard, Clarence W. R. Wade, Andrew F. Hegyeli, James W. Boke, and Robert J. Ruderman. 1972, 14p

Descriptors: (*Calcification, Biochemistry), (*Adenosine phosphates, Calcification), Mitochondria, Bone, Minerals, Tissues (Biology).

Because adenosine 5' triphosphate (ATP) has been found in calcifying tissue and because this compound markedly influences calcification, it has been suggested that ATP may be an important intermediate in the calcification process. Furthermore, it has been proposed that mitochondria are involved in bone mineralization and that these oranelles can concentrate calcium ions in a process dependent on ATP. A mechanism of mineralization, cyclical in nature, and which can be described by balanced chemical equations. In the mechanism, ATP reacts with calcium ion to form a calcium complex which, on hydrolysis , first to pyrophosphate and subsequently to apatite, provides the materials for bone mineralization. Adenosine and orthophosphoric acid are also formed which combine to regenerate ATP.

AD-750 582 PC$3.00/MF$0.95
Army Medical Research Lab Fort Knox Ky
A COMPARISON BETWEEN AUTOMATED AND MANUAL ASSAYS OF ADENOSINE TRIPHOSPHATE AND 2,3--DIPHOSPHOGLYCERATE IN BLOOD.
Interim rept.,
Walter F. Kocholaty, R. Ben Dawson, Jr., Alan G. Auwarter, Thomas A. Billings, and Davis Crater. 16 Aug 72, 12p Rept no. USAMRL-995

Descriptors: (*Organic phosphorus compounds, *Blood chemistry), (*Adenosine phosphates, Blood chemistry), Automation, Phosphates, Volumetric analysis, Enzymes, Hydrazones.
Identifiers: *Glyceric acid/bis (dihydrogenphosphate), Fluorometers.

Twenty samples of normal blood for levels of ATP and 2,3-DPG were assayed; values obtained by automated assay were consistently and considerably higher than those obtained by the manual method. (Author)

AD-750 586 PC$3.00/MF$0.95
Edgewood Arsenal Md
ACETYLCHOLINESTERASE SUBSTRATES: ACETOXYMETHYLPYRIDINES AND BENZYL ACETATE.
Technical rept. Jul 71-Jan 72,
George M. Steinberg, Norman C. Thomas, Morton L. Mednick, and Joseph W. Amshey, Jr. Sep 72, 17p Rept no. EA-TR-4669

Descriptors: (*Acetylcholinesterase, Substrates), (*Hydrolysis, Acetylcholinesterase), Reaction kinetics, Pyridines, Acetates, Spectra (Visible + ultraviolet), Hydrolysis.
Identifiers: Chemical reaction mechanisms.

2-Acetyloxymethylpyridine (compound I) and 2-, 3-, and 4-acetoxymethylpyridinium methiodides (compounds II, III, and IV) are spectrophotometrically useful substrates for acetylcholinesterase. Compounds III and IV are highly water soluble, yet equal to phenyl acetate in resistance toward aqueous hydrolysis. Compound I and benzyl acetate are appreciably more stable. Kinetic constants for both enzymatic and nonenzymatic hydrolysis are reported. Comparison of the relative rates of acylation of acetylcholinesterase by compounds I, III, and IV are phenyl acetate indicates considerable kinetic selectivity. Contrary to general expectations, the uncharged compounds, I and phenyl acetate, have the highest turnover rates. (Author)

AD-750 587 PC$3.00/MF$0.95
Edgewood Arsenal Md
A PROCEDURE FOR THE MICRODETERMINATION OF CHOLINE ACETYLTRANSFERASE.
Technical rept. Mar-Sep 71,
Henry I. Yamamura, Tommy L. Gardner, and Alan M. Goldberg. Sep 72, 21p Rept no. EA-TR-4674

Descriptors: (*Transferases, Microanalysis), Alkyl transferases, Labeled substances, Acetylcholine, Solvent extraction, Enzyme inhibitors.
Identifiers: Acetyltransferase/choline.

A micromethod for the determination of choline acetyltransferase was developed using 300 micro M acetyl Co A and 5 mM choline as substrates. The reaction yielded (14C) acetylcholine, which was extracted with sodium tetraphenylboron in 3-heptanone; and an aliquot was counted utilizing a Tricarb scintillation spectrometer. The sensitivity of the method was approximately 10 to the -12th power moles of (14C) acetylcholine synthesized/hour. Using whole rat brain homogenates, the specific activity was determined after the addition of Triton X-100 (0.5%) to the homogenate in 0.32 M sucrose. Soman (0.1 mM) did not inhibit choline acetyltransferase activity; however, a specific tertiary inhibitor of choline acetyltransferase 4- (1-naphthylvinyl)-pyridine (0.1 mM), was effective in producing 100% inhibition. A brief study was conducted using various inhibitors of choline acetyltransferase in order to determine the possibility of regulating acetylcholine synthesis and also to determine the possibility of purifying the enzyme utilizing affinity chromatography. (Author)

AD-750 637 PC$3.00/MF$0.95
Bryn Mawr Hospital Pa
THE EFFECT OF PH AND INOSINE ON THE REGENERATION OF ATP, 2,3-DPG AND P (50) OF BLOOD INCUBATED AT 1C. AND 37C.
Annual summary rept. no. 69, 16 Oct 71-30 Sep 72,
Paul V. Strumia. 1 Oct 72, 9p
Contract DADA17-71-C-1043

Descriptors: (*Blood, Preservation), (*Organic phosphorus compounds, Blood), Storage, Temperature, pH, Adenosine phosphates, Blood transfusions, Stability, Oxygen, Erythrocytes, Viability.
Identifiers: Glyceric acid/bis (dihydrogenphosphate), Blood preservatives, Inosines.

The technical objective of the work reported was to develop practical methods to maintain the highest level of 2,3-DPG and oxygen dissociation along with a reasonable survival. ATP values of 69% plus or minus 2 compatible with 70% survival were achieved with any of the methods reported. Best function, as reflected by 2,3-DPG and P (50) values, was achieved when blood was collected into ACD pH 5.6 and incubated at 37C. with inosine at pH 7.0 or 7.2. (Author)

AD-750 682 PC$3.00/MF$0.95
Armed Forces Radiobiology Research Inst Bethesda Md
AN AUTOMATED PCO2 ASSAY FOR GLUTAMIC ACID DECARBOXYLASE.
Technical note,
G. H. Zeman, P. Z. Sobocinski, and R. L. Chaput. Jul 72, 15p Rept no. AFRRI-TN72-4

Descriptors: (*Enzymes, *Glutamic acid), Carbon dioxide, Reaction kinetics, Chemical analysis, Automation, Pressure, Measurement.
Identifiers: *Decarboxylase/glutamate, Enzyme activity.

An automated assay for determination of glutamic acid decarboxylase activity is described. The PCO2 of an incubation medium is used as a measure of total CO2 formed by enzymic decarboxylation of glutamate. Details of manifold construction, reagent composition, and data concerning the reliability of the method are presented. (Author)

AD-750 959 Reprint
Nagasaki Univ (Japan) Atomic Disease Inst
MAMMALIAN ALPHA-KETO ACID DEHYDROGENASE COMPLEXES: VII. RESOLUTION AND RECONSTITUTION OF THE PIG HEART 2-OXOGLUTARATE DEHYDROGENASE COMPLEX,
N. Tanaka, K. Koike, M. Hamada, K. Otsuka, and T. Suematsu. 24 Jan 72, 9p ARDG (FE)-J-232-7
Grant DA-crd-afe-s92-544-68-g145
See also report dated 16 Jan 70, AD-719 882.
Availability: Pub. in Jnl. of Biological Chemistry, v247 n12 p4043-4049, 25 Jun 72.

Descriptors: (*Oxidoreductases, Purification), Heart, Complex compounds, Swine, Chromatographic analysis, Electron microscopy, Molecular weight, Japan.
Identifiers: Dehydrogenase/oxoglutarate, Flavoproteins.

The nonionic detergent Triton X-100 has been found to solubilize readily the pig heart 2-oxoglutarate dehydrogenase complex from the protamine precipitate eluate. A highly active preparation was obtained from the Triton X-100 extract by calcium phosphate gel-cellulose column chromatography. The complex was first separated into lipoamide dehydrogenase and a colorless fraction by fractionation on a calcium phosphate gel-cellulose column in the presence of 2.5 M urea. Then, the latter fraction was further dissociated into two additional components, 2-oxoglutarate dehydrogenase and lipoate succinyltransferase. When mixed at neutral pH, the three isolated enzymes reassociated spontaneously to produce a large unit functionally and structurally resembling the native complex. Electron micrographs of the complex negatively stained with 0.25% sodium phosphotungstate (pH 7.2) showed a polyhedral structure with a diameter of about 260 A.

AD-750 970 Reprint
Kaohsiung Medical Coll (Taiwan) Dept of Biochemistry
PHOTOOXIDATION OF COBROTOXIN,
J. S. Huang, S. S. Liu, K. H. Ling, C. C. Chang, and C. C. Yang. 20 Nov 71, 9pp ARDG (FE)-428
Grant DA-S92-544-72-G-182
Availability: Pub. in Jnl. of the Formosan Medical Association, v71 p383-388 1972.

Descriptors: (*Reptiles, Venoms), (*Venoms, Toxins + antioxins), Molecular structure, Amino acids, Biochemistry, Photochemistry, Oxidation, Taiwan.
Identifiers: *Cobrotoxin, *Snake venoms, Histidine, Amino acid sequence.

Photooxidation of cobrotoxin, a neurotoxic protein isolated from the Taiwan cobra (Naja naja atra) venom was carried out in the presence of methylene blue. The reaction proceeded rapidly and His-32 was found to be more accessible to photooxidation than His-4. The lethal toxicity and antigenic specificity were greatly diminished when His-32 was photooxidized, indicating that the intact histidine residue at position 32 in cobrotoxin is involved in the biological activity of the toxin. (Author)

AD-750 972 Reprint
Princeton Univ N J Dept of Physics
AN ALLOSTERIC MODEL OF HEMOGLOBIN II. THE ASSUMPTION OF INDEPENDENT BINDING,
R. G. Shulman, S. Ogawa, and J. J. Hopfield. 7 Sep 71, 8p AFOSR-TR-72-2041
Contract AF 49 (638)-1545
See also report dated 29 Jun 71, AD-737 551. Prepared in cooperation with Bell Telephone Labs., Inc., Murray Hill, N. J.
Availability: Pub. in Archives of Biochemistry and Biophysics, v151 n1 p68-74 Jul 72.

Descriptors: (*Hemoglobin, Chemical bonds), (*Molecular isomerism, Hemoglobin), Reaction kinetics, Molecular properties, Mutations, Oxygen, Carbon monoxide, Biochemistry, Biophysics, Models (Simulations).

One assumption of the Monod, Wyman, and Changeux (MWC) allosteric model of hemoglobin is that the ligand binding energies depend only upon the conformation R or T, and are independent of the degree of ligation. Canonical values of the equilibrium and kinetic constants for the R and T forms are obtained from the measurements, mainly by Gibson and Roughton, of the last and first ligands binding to hemoglobin. These values measured for mutant and chemically modified hemoglobins which are frozen in one quaternary structure or another. From these comparisons we conclude that nearly all of the affinity differences between the R and T forms are contributed by the quaternary structures and that the parameters for O2 binding are to a first order independent of the degree of ligation. Kinetic and equilibrium constants of the mutants, Hemoglobin for the R and T forms are shown to be consistent with those values by postulating an earlier switch from T to R than is observed in HbA, as was originally discussed by Edelstein. (Author)

COM-72-11337 Reprint
National Marine Fisheries Service, Seattle, Wash. Northwest Fisheries Center.
LIPID BIOSYNTHESIS AND INCREASE IN ISOVALERIC ACID OF PLASMA,
Donald C. Malins, Usha Varanasi, and John C. Wekell. 20 Mar 72, 3p NOAA-72082108
Revision of report dated 28 Jan 72. Prepared in cooperation with Seattle Univ., Wash.
Pub. in Science, v176 p1357, 23 Jun 72.

Descriptors: (*Lipids, Porpoises), (*Valeric acid, Porpoises), Biosynthesis, Aquatic animals, Mammals, Tissues (Biology), Acoustic properties.
Identifiers: Isovaleric acid.

A brief note suggesting that blocking of incorporation of the isovaleryl CoA in lipid biosynthesis may be an additional factor in the accumulation of isovaleric acid in the plasma of patients inflicted with isovaleric acidemia. Reference is made to an example of isovaleric acid 'detoxification' in porpoise acoustic tissues where large amounts of lipids containing isovaleric acid and long-chain iso acids are deposited.

N72-28130 PC$3.00/MF$0.95
Miami Univ., Coral Gables, Fla. Inst. of Molecular Evolution.
THE RAPID EVOLUTION OF COMPLEX SYSTEMS FROM SIMPLE BEGINNINGS.
S. W. Fox. 1971, 18p NASA-CR-127466, CONTRIB-194
Contract NGR-10-007-008
Conf- Presented At the 3d Intern. Conf. on Phys. Theory in Biol. (Inst. de La Vie), Versailles, France, 22 Jun. 1971

Descriptors: *Amino acids, *Biosynthesis, *Evolution (development), Organic chemistry, Polymerization, Temperature effects.

For abstract, see STAR 10 19.

N72-28137 PC$3.00/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
THE ABIOGENETIC FORMATION OF PORPHIN, CHLORIN, AND BACTERIOCHLORIN.
A. A. Krasnovskiy, and A. V. Umrikhina. Jul 72, 8p NASA-TT-F-14355
Contract NASW-2038
Tran- Transl. Into English From Dokl. Akad. Nauk Sssr (Moscow), V. 202, No. 1, 1972 P 221-224

Descriptors: *Abiogenesis, *Bionics, *Chemical reactions, *Porphyrins, Biogeny, Biological evolution, Environment simulation.

For abstract, see STAR 10 19.

6B. Bioengineering

N72-28049 PC$3.00/MF$0.95
Lockheed Missiles and Space Co., Sunnyvale, Calif.
LABORATORY VERIFICATION OPTICAL SIGNAL COUPLING. IMBLMS PHASE B.4, APPENDIX C, SECTION 12.
21 Dec 70, 18p NASA-CR-115719,
LMSC-A980463-APP-C-SEC-12
Contract NAS9-10742

Descriptors: *Bioengineering, *Biotelemetry, *Imblms, *Optical coupling, Audio frequencies, Data transmission, Signal processing.

For abstract, see STAR 10 19.

N72-28050 PC$3.25/MF$0.95
Lockheed Missiles and Space Co., Sunnyvale, Calif.
LABORATORY VERIFICATION RESPIRATORY MEASUREMENTS. IMBLMS PHASE B.4, APPENDIX C, SECTION 13.
Final Report
11 Dec 70, 23p NASA-CR-115718,
LMSC-A980463-APP-C-SEC-13
Contract NAS9-10742

Descriptors: *Bioengineering, *Bioinstrumentation, *Imblms, *Respirometers, Carbon dioxide, Cardiology, Flow velocity, Respiration, Spirometers.

For abstract, see STAR 10 19.

N72-28087 PC$4.00/MF$0.95
General Dynamics/Convair, San Diego, Calif.
LIFE SCIENCES PAYLOAD DEFINITION AND INTEGRATION STUDY. VOLUME 1 MANAGEMENT SUMMARY.
Mar 72, 36p NASA-CR-123738,
GDC-DBD72-002-VOL-1
Contract NAS8-26468

Descriptors: *Life sciences, *Payloads, *Space missions, *Systems analysis, Equipment specifications, Mission planning, Spacecraft components, Test facilities.

For abstract, see STAR 10 19.

N72-28088 PC$14.00/MF$0.95
General Dynamics/Convair, San Diego, Calif.
LIFE SCIENCES PAYLOAD DEFINITION AND INTEGRATION STUDY. VOLUME 2 REQUIREMENTS AND DESIGN STUDIES.
Mar 72, 239p NASA-CR-123739,
GDC-DBD72-002-VOL-2
Contract NAS8-26468

Descriptors: *Biomedical data, *Life sciences, *Life support systems, *Payloads, *Research projects, *Space missions, Equipment specifications, Spacecraft components, Systems analysis, Test equipment.

For abstract, see STAR 10 19.

N72-28089 PC$14.25/MF$0.95
General Dynamics/Convair, San Diego, Calif.
LIFE SCIENCES PAYLOAD DEFINITION AND INTEGRATION STUDY. VOLUME 3 APPENDICES.
Mar 72, 243p NASA-CR-123737,
GDC-DBD72-002-VOL-3
Contract NAS8-26468

Descriptors: *Biomedical data, *Life sciences, *Operations research, *Payloads, *Space missions, Equipment specifications, Operations research, Systems analysis.

For abstract, see STAR 10 19.

N72-29085 PC$5.00/MF$0.95
Baylor Univ., Houston, Tex.
RESEARCH PROGRAM FOR EXPERIMENT M133.
Final Report
J. D. Frost, Jr. 31 May 72, 56p NASA-CR-115745
Contract NAS9-11855

Descriptors: *In-flight monitoring, *Skylab program, *Sleep, Data acquisition, Reliability engineering, Research and development, Telemetry.

For abstract, see STAR 10 20.

6C. Biology

AD-750 425 PC$3.00/MF$0.95
Naval Undersea Center San Diego Calif
CONTINGENCY RATION FOR CALIFORNIA SEA LIONS (ZALOPHUS CALIFORNIANUS).
Research and development rept. Sep-Nov 71,
Don Van Dyke. Sep 72, 13p Rept no. NUC-TP-317

Descriptors: (*Seals (Zoology), Food), Storage, Nutrition, Mixtures, Test methods, Acceptability, Pasteurization.
Identifiers: Zalophus californianus, Animal nutrition.

The report describes the formulation and preparation of a prepared ration for short term feeding the California sea lion (Zalophus californianus). (Author)

AD-750 491 PC$3.25/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
F. ENGELS AND THE SOCIO-BIOLOGICAL PROBLEM,
G. K. Tsaregorodtsev. 14 Jul 72, 22p Rept no. FTD-HT-23-1310-72
Edited trans. of Voprosy Filosofii (USSR) n11 p83-91 1970, by Bernard L. Tauber.

Descriptors: (*Biology, *Sociology), Correlation techniques, Behavior, Population, Ecology, Physiology, Genetics, USSR.
Identifiers: Translations.

The scientific understanding of correlation between social and biological element has a great methodological significance for the entire complex of sciences of man. The biological element is represented in man by laws of metabolism and the exchange of energies. These laws are conditioned by the morphophysiological characteristics of the organism. They operate in accordance with the specific 'genetic programme' of the organism and ensure its existence in socio-ecological environment. The biological element is closely linked with the social one. In its broad sense, the social element is understood as the totality of laws, properties and specific features organically inherent in different stable social associations. In relation to the individual, the social element is understood as his social existence as distinct from organic, physical being. (Author)

AD-750 720 PC$3.00/MF$0.95
Cullen Coll of Engineering Houston Tex
CELL KINETICS SIMULATION SYSTEM.
Technical rept.,
Osman S. Ozkul, and Charles E. Donaghey. Aug 72, 105p Rept no. RE-1-72
Contract N00014-68-A-0151

Descriptors: (*Cells (Biology), Mathematical models), (*Programming (Computers), Cells (Biology)), Physiology, Stochastic processes, Computer programs, Interfaces, Mitosis, Probability density functions, Graphics, Random variables, Simulation, Experimental design.
Identifiers: Digital simulation, Themis project, IBM 360/44 computers, *Simulation languages, Erlang density functions, FORTRAN, FORTRAN 4 programming language.

A generalized stochastic simulation system has been developed to simulate experiments in cell cycle kinetics. The model to be simulated is described by the user according to his theoretical convictions, and the attributes of the experiment being simulated. In order to make the task of describing a model easy for the user a language is interfaced with the simulator. Special care has been taken in the design of this language to have it contain the terminology of the field of experimental biology, and to have it as flexible as possible to meet different areas of interests. The structure of the language has been kept as simple as possible in order to minimize the learning time. A program written in this language also reflects the assumptions as well as the logic in the model being described. The complete system has been implemented on an IBM 360/44 computer. (Author)

AD-750 765 PC$3.00/MF$0.95
California State Univ Long Beach Dept of Biology
A COMPARATIVE CHEMICAL AND ZOOTOXICOLOGICAL STUDY OF THREE STRONGYLOCENTROTID SEA URCHINS.
Final rept. 1 Apr 69-31 Aug 72,
Charles B. Alender. 31 Aug 72, 105p Rept no. 14
Contract N00014-C-69-0191

Descriptors: (*Echinodermata, *Proteins), (*Toxicity, Echinodermata), Toxins + Antitoxins, Skeletal muscle relaxants, Parasympathomimetic agents, Pharmacology, Crustacea, Cats, Mice.
Identifiers: *Sea urchins.

The pedicellariae (P) and spines (S) of three Strongylocentrotid sea urchins were found to possess high mol wt toxic proteins which were active in the crab and certain crab preparations. The site of action appears either at the axon or muscle membrane, and they may produce their effect by altering membrane permeability to K (+) and Na (+). These proteins are inactive in the cat and mouse. No low mol wt toxic components were detected. Moreover, in a toxopneustid species, both toxic proteins and a low mol wt component were isolated from their P and S. The protein (s) was lethal to the crab but inactive in the mouse. This protein (s) appears to act on the axon terminal membrane causing a neuro-muscular block. The low mol wt component is cholinomimetic in action; is active in the cat and mouse; inactive in the crab; and has been isolated, purified, and tentatively identified. Finally, EM morphology of gland sacs found in the P of one of the Strongylocentrotid species was shown to contain mucoid cells possessing vacuoles which are postulated to manufacture and store the toxin. (Author)

AD-750 815 Reprint
Naval Medical Research Unit No 3 Fpo New York 09527
ABORPHYSALIS, A NEW SUBGENUS OF ASIAN HAEMAPHYSALIS TICKS; AND IDENTITY, DISTRIBUTION, AND HOSTS OF H. ABORENSIS WARBURTON (RESURRECTED) (IOXODOIDEA: IXODIDAE).
Interim rept.,
Harry Hoogstraal, Vijai Dhanda, and Kawther M. El Kammah. 8 Mar 71, 17p Rept no. NAMRU-3-TR-35-72
Availability: Pub. in Jnl. of Parasitology, v57 n4 p748-760 Aug 71.

Descriptors: (*Ticks, Classification), Identification, Life cycle, Larvae, Nymph, Males, Females, Ecology, Morphology (Biology), Parasites, Mammals, Birds, Entomology, Asia.
Identifiers: Haemaphysalis aborensis, Aborphysalis, Haemaphysalis kyasanurensis, Haemaphysalis formosensis, Haemaphysalis atherurus, Haemaphysalis capricornes.

Haemaphysalis aboreasis Warburton, which was originally briefly described from a single female

specimen from the Abor Hills in northeastern India, has long been a taxon of uncertain status. The holotype is redescribed and illustrated, together with other females, males, nymphs, and larvae in samples from the Nepal terai, in the west, through northeastern India and northern Burma and Thailand, to Laos and North Vietnam. This species is closely related to H. kyasanurensis Trapido Hoogstraal, and Rajagopalan (S India, Ceylon) and to H. formosensis Neumann (Philippines, Taiwan, S Japan). Adults of these 3 species parasitize medium- and large-size forest-dwelling mammals; immature stages infest ground-feeding birds and small- to medium-size mammals. H. atherurus Hoogstraal, Trapido, and Kohls (Malaysia, Thailand, Vietnam) is a more specialized relative whose adult and immature stages feed on the brush-tailed porcupine. H. capricornis, known only from males from serow in southern Thailand, is tentatively included in this assemblage. These 5 species comprise the newly designated subgenus Aborphysalis. The distribution of each species appears to be localized in forests, usually below 5,000 ft altitude, between Ceylon and southern Japan. (Author)

AD-750 816 Reprint
Naval Medical Research Unit No 3 Fpo New York 09527
HAEMAPHYSALIS (KAISERIANA) BORNEATA SP. N. (IXODOIDEA: IXODIDAE), A TICK OF THE H. (K) ACULEATA GROUP PARASITIZING THE SAMBAR DEER IN BORNEO,
Harry Hoogstraal. 22 Oct 70, 7p Rept no. NAMRU-3-TR-38-72
Availability: Pub. in Jnl. OF Parasitology, v57 n5 p1096-1098 Oct 71.

Descriptors: (*Ticks, Classification), Identification, Morphology (Biology), Parasites, Mammals, Carnivora, Ceylon, India.
Identifiers: Haemaphysalis borneata, Haemaphysalis aculeata, Taxonomy, Haemaphysalis cuspidata.

Haemaphysalis (Kaiseriana) borneata sp.n., described from a single male collected from a sambar deer in northern Borneo in 1913, is related to H. (K) aculeata Lavarra and H. (K.) cuspidata Warburton which parasitize the mouse deer and small-size carnivores in Ceylon and India. The H. (K.) aculeata group is remarkable for its elongate palpi and large spurs. (Author)

AD-750 817 Reprint
Naval Medical Research Unit No 3 Fpo New York 09527
HAEMAPHYSALIS (ALLOPHYSALIS) WARBURTONI NUTTALL: DESCRIPTION OF IMMATURE STAGES, ADULT STRUCTURAL VARIATION, AND HOSTS AND ECOLOGY IN NEPAL, WITH A REDEFINITION OF THE SUBGENUS ALLOPHYSALIS HOOGSTRAAL (IXODOIDEA: IXODIDAE).
Interim rept.,
Harry Hoogstraal. 13 May 71, 17p Rept no. NAMRU-3-TR-40-72
Availability: Pub. in Jnl. of Parasitology, v57 n5 p1083-1095 Oct 71.

Descriptors: (*Ticks, Classification), Entomology, Life cycle, Morphology (Biology), Parasites, Animals, Mammals, Rodents, Birds, Ecology, Asia.
Identifiers: Haemaphysalis warburtoni, Allophysalis warburtoni, Taxonomy, Phenology, Host parasite relations.

The phylogenetic position and species composition of the structurally primitive Haemaphysalis subgenus Allophysalis Hoogstraal have been uncertain owing to critical lack of knowledge of immature stages of H. (A.) warburtoni Nuttall, the type species of this subgenus, previously known only from 11 adult specimens from China. Recent collections of 30 adult and 471 immature stage specimens of warburtoni from Nepal provide data for describing and characterizing the immature stages in relation to those of H. (A.) pospelovshtromae Hoogstraal and H. (A.) garhwalensis Dhanda and Bhat, and for redefining the subgenus Allophysalis. Adult warburtoni show considerable variation in som structural characters. Samples of warburtoni were collected in alpine and subalpine biotopes from 8,100 to 12,500 ft altitude in the Himalayas of northcentral Nepal. Adults parasitized the brown goral, Himalayan thar, and domestic sheep and cow-yak hybrids (Artiodactyla, Caprinae, and Bovinae). Nymphs fed on domestic sheep and, together with larvae, on the Himalayan thar and in the ears of monal pheasants. One larva infested a mouse. (Author)

AD-750 818 Reprint
Naval Medical Research Unit No 3 Fpo New York 09527
HAEMAPHYSALIS (H.) SUMATRAENSIS SP. N. (IXODOIDEA: IXOLIDAE), A TICK PARASITIZING THE TIGER, BOAR, AND SAMBAR DEER IN INDONESIA.
Interim rept.,
Harry Hoogstraal, Kawther M. El Kammah, Sampurno Kadarsan, and George Anastos. 13 May 71, 10p Rept no. NAMRU-3-TR-39-72
Availability: Pub. in Jnl. of Parasitology, v57 n5 p1104-1109 Oct 71.

Descriptors: (*Ticks, Classification), Entomology, Parasites, Life cycle, Nymph, Mammals, Carnivora, Larvae, Plants (Botany), Ecology, Morphology (Biology), Identification, Indonesia.
Identifiers: Hemaphysalis sumatraensis, Host parasite relations, Taxonomy.

Haemaphysalis (H.) sumatraensis sp. n. is described from adults parasitizing the Sumatran tiger, Felis tigris sunmatrae Pocock, wild boar, Sus scrofa vittatus Boie, and sambar deer, Cervus unicolor equinus Cuvier, and swept from vegetation in lowland forests of southern Sumatra. This member of the H. (H.) obesa group of the Oriental Faunal Region is related to H. (H.) obesa Larrousse (NE India to Vietnam, Thailand, N Malaya) and H. (H.) hirsuta Hoogstraal, Trapido, and Kohls (Java, Sumatra), but lacks the unusual setal patches characterizing the related species. The structure of the female external gential area is unique in each species. These species also appear to be related to H. (H.) turturis Nuttall and Warburton of the Indian Subregion, which lacks specialized female gential structure and unusual setae. H. (H.) hirsuta, previously known only by two adult specimens from Java, is recorded from numerous adults, nymphs, and a larva from forest vegetation in western Java and from adults parasitizing a wild boar and nymphs from forest vegetation and a sambar deeer in the same localities as H. (H.) sumatraensis in southern Sumatra. (Author)

AD-750 819 Reprint
Iowa State Univ Ames Dept of Zoology and Entomology
DESCRIPTIONS OF NEW FLEAS FROM NEPAL, WITH NOTES ON THE GENUS 'CALLOPSYLLA WAGNER, 1934 (SIPHONAPTERA: CERATOPHYLLIDAE),
Robert E. Lewis. 23 Feb 71, 14p NAMRU-3-TR-36-72
Contract N00014-68-A-0101-0001
Availability: Pub. in The Jnl. of Parasitology, v57 n4 p761-771 Aug 71.

Descriptors: (*Siphonaptera, Identification), Classification, Morphology (Biology), Anatomy, Females, Males, Arthropods, Parasites, Entomology.
Identifiers: Callopsylla fusca, Citellophilus mygala, Citellophilus atallahi.

Three new ceratophyllid fleas are described from collections made in Nepal. Callopsylla (Orneacus) fusca sp. n., an ecteparasite of certain passerine birds at high elevations, is a dark species much resembling some members of the genus Monopsyllus in the modified segments of the male. Both Citellophilus mygala sp. n. and C. atallahi sp.n. differ from most other members of the genus in the possession of a pair of short, spiniform setae on the caudal margin of the movable process and the proportions of the apex of the ninth sternite. A brief history of the genus Callopsylla is presented and comparisons are made with closely related genera. (Author)

AD-750 820 Reprint
Naval Medical Research Unit No 3 Fpo New York 09527
STUDIES ON SOUTHEAST ASIAN HAEMAPHYSALIS TICKS (IXODOIDEA: IXODIDAE). IDENTITY AND HOSTS OF IMMATURE STAGES OF H. (RHIPISTOMA) ASIATICA (SUPINO) FROM THAILAND.
Interim rept.,
Yutaka Saito, Harry Hoogstraal, and Cherdlarp Vasuvat. 18 May 71, 9p Rept no. NAMRU-3-TR-37-72
Availability: Pub. in Jnl. of Parasitology, v57 n5 p1099-1103 Oct 71.

Descriptors: (*Ticks, Identification), Entomology, Southeast Asia, Parasites, Life cycle, Larvae, Nymph, Mammals, Rodents, Plants (Botany), Thailand.
Identifiers: Haemaphysalis asiatica, Host parasite relations.

The nymph and larva of Haemaphysalis (Rhipistoma) asiatica (Supino) are described and confirmed as this species by reared adult specimens and their immature stage exuviae, and by other nymphs and larvae from the same collections from forested areas of southcentral Thailand. Immature stages infested tree shrews, Tupaia glis subsp., Berdmore squirrels, Menetes berdmorei subsp., and rats, Rattus sp., and were also collected from forest vegetation. Nymphs and larvae previously tentatively identified as H. (R.) asiatica (sic asiaticus) belong to a different species.

AD-750 827 Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
SEASONAL ABUNDANCE OF ADULT 'AEDES AEGYPTI' IN DJAKARTA, INDONESIA.
Technical rept.,
P. F. D. Van Peenen, Soeroto Atmosoedjono, J. C. Lien, and Sulianti Saroso, J. 1972, 8p Rept no. NAMRU-2-TR-514
Availability: Pub. in Mosquito News, v32 n2 p176-179 Jun 72.

Descriptors: (*Aedes, *Indonesia), Periodic variations, Abundance, Culicidae, Disease vectors, Dengue, Virus diseases, Entomology.
Identifiers: Aedes aegypti.

Adult Aedes aegypti mosquitoes were collected systematically from houses in four areas of Djakarta, Indonesia during 1970-71. This species was easily collected from different parts of the city during all months of the year. There was considerable variation in monthly abundance of adult female Aedes aegypti from area to area, but there was no clearcut seasonal pattern, despite a distinct rainy season. (Author)

AD-750 834 Reprint
California Univ San Francisco George Williams Hooper Foundation
'ECHINOSTOMA LINDOENSE': LARVAL ANTIGENS FROM THE SNAIL INTERMEDIATE HOST, 'BIOMPHALARIA GLABRATA',
Donald Heyneman, W. Page Faulk, and H. Hugh Fudenberg. 10 Dec 70, 13p
Sponsored in part by Office of Naval Research, Arlington, Va. and National Institutes of Health.
Availability: Pub. in Experimental Parasitology, v29 n3 p480-492 Jun 71.

Descriptors: (*Trematodes, *Gastropoda), (*Antigens + Antibodies, Trematodes), Platyhelminths, Parasites, Serodiagnosis, Immunology.
Identifiers: Echinostoma lindoense, Biomphalaria glabrata, Host parasite relations.

Passive hemagglutination using chromic chloride proved to be a rapid and useful method for a study of minute quantities of antigen extracted from larval Echinostoma lindoense, a trematode that develops in the snail intermediate host, Biomphalaria glabrata. Parasite rediae were initially fragmented by three different procedures. Their soluble proteins were separated into two bands by electrophoresis on cellulose acetate, and into three fractions by molecular sieve chromatography. Rabbit antiserum was prepared from six weekly intramuscular injections of soluble radial protein in complete Freund's adjuvant, followed after 1 month by a single inoculation of alum-precipitated antigen. Antiserum was absorbed free of anti-snail antibodies and the immune complexes were removed by ion-exchange chromatography over DEAE-cellulose, producing an immunochemically pure IgG. Study of the rabbit anti-trematode antibody by precipitation, complement fixation, hemagglutination (HA), and inhibition of HA revealed a specific and high titered anti-larval antibody. These methods offer an approach to the problem of measuring the snail host's protective response against trematode reinfection; they also can be used to study the antigenic maturation of successive larval stages in the intermediate host. (Author)

AD-750 835 Reprint
California Univ San Francisco School of Medicine
DISTRIBUTION OF THE IMMUNOGLOBULIN MARKERS AT THE IGG1, IGG2, IGG3, IGA (2), AND K-CHAIN LOCI IN AUSTRALIAN ABORIGINES: COMPARISON WITH NEW GUINEA POPULATIONS,
C. C. Curtain, Erna van Loghem, H. Hugh Fudenberg, N. B. Tindale, and R. T. Simmons. 30 Sep 71, 11p
Contract Nonr-3656 (12), Grant PHS-AM-08527
Revision of report dated 1 Jul 71.
Availability: Pub. in The American Jnl. of Human Genetics, v24 n2 p145-155 Mar 72.

Descriptors: (*Gamma globulin, Genetics), (*Anthropology, Gamma globulin), (*Genetics, Anthropology), Population, Australia, New Guinea.
Identifiers: *Australian aborigines, Genetic markers.

In recent years, studies on the physical anthropology of the Australian Aborigines have been supplemented by data on blood groups and various serum protein polymorphisms, the haptoglobin and transferrin types, the serum Gc component, serum pseudocholinesterase, and a range of immunoglobin markers and enzyme groups. The immunoglobulin groups, in particular, promise to be of very great value in population studies in general. It is well established that the various immunoglobulin markers are inherited in different combinations in each of the main ethnic groups. The results of the typing of sera from selected Australian aboriginal populations for Gm (IgG1, IgG2, and IgG3 loci), Inv (k-light chain locus), and Am (IgA2 locus) markers are presented. These results are compared and contrasted with published and new data from New Guinea populations adjacent to the Australian mainland.

COM-72-11309 PC$3.00/MF$0.95
Alabama Dept. of Conservation and Natural Resources, Montgomery.
SURVEY OF THE LIVE BAIT SHRIMP INDUSTRY OF ALABAMA.
Completion rept. Mar 69-Mar 70,
Wayne E. Swingle. Mar 70, 31p NOAA-72092018
Grant NMFS-2-83-R
Supersedes COM-72-11149.

Descriptors: (*Shrimp, *Fisheries), Economic analysis, Alabama.
Identifiers: Fishing bait, Penaeus aztecus, Penaeus setiferus, Penaeus duorarum.

During 1968 there were 24 bona fide live bait shrimp dealers operating in Alabama who sold 1,544,000 live shrimp and 22,200 pounds of dead shrimp having a retail value of $76,540. The capital investment per dealer was $3,303 for facilities and equipment. No shrimp were exported from Alabama, and only a negligible amount was imported into Alabama. Brown shrimp (Penaeus aztecus) and white shrimp (Penaeus setiferus) were the major species taken. Brown shrimp entered the estuaries first and were gradually replaced by white shrimp. The fishery normally operated from June through November. Length-weight relationships were determined for brown shrimp, white shrimp, and pink shrimp (Peneaus duorarum).

COM-72-11316 PC$3.00/MF$0.95
Oklahoma Dept. of Wildlife Conservation, Oklahoma City.
COMMERCIAL FISHERIES INVESTIGATIONS.
Completion rept. Sep 66-Dec 69,
Robert C. Summerfelt. Dec 70, 219p NOAA-72092022
Grant NMFS-4-24-R
Prepared in cooperation with Oklahoma State Univ., Stillwater.

Descriptors: (*Fresh water fishes, Food habits), (*Fisheries, Oklahoma), Animal migrations, Marking, Animal ecology, Reservoirs, Abundance, Benthos, Suspended sediments, Biomass, Catfishes, Carp, Bass, Parasites.
Identifiers: Drum fish, Carpsuckers, White crappie.

Commercial Fisheries Investigations consisted of five separate biological studies on distribution food habits and home range. These biological studies were intended to complement statistical surveys on the commercial fish harvest as obtained in Oklahoma Project 4-24-D. (A) Sub-projects 1 and 3: 'Assessment of Environmental Influencing the Distribution of Bottom Fishes in Reservoirs'. (B) Sub-projects 2 and 4: 'Food Habits of Adult Commercial Fishes From Five Oklahoma Reservoirs'. (C) Sub-project 5: 'Home Range, Homing, and Activity Patterns of the Flathead Catfish'. (Author)

COM-72-11317 PC$3.00/MF$0.95
Kentucky Dept. of Fish and Wildlife Resources, Frankfort.
MUSSEL FISHERY INVESTIGATIONS TENNESSEE, OHIO, AND GREEN RIVERS.
Final completion rept. 1 Jul 66-30 Jun 69,
John C. Williams. 30 Jun 69, 116p NOAA-72091994
Grant NMFS-4-19-R

Descriptors: (*Mussels, Fisheries), Abundance, Evaluation, Rivers, Sampling, Statistical data, Kentucky.
Identifiers: Tennessee River, Ohio River, Green River.

A mussel fishery investigation was instituted in 1966-69 on the portions of the Tennessee, Ohio, and Green Rivers that flow in Kentucky. The Ohio and Tennessee Rivers supported population of commercial mussels. The Green River did not have a mussel fauna abundant enough or in sufficient numbers of legal size individuals to support a commercial mussel fishery. (Author)

COM-72-11320 Reprint
Bureau of Commercial Fisheries, Pascagoula, Miss. Exploratory Fishing and Gear Research Base.
A GENERAL RESUME OF OREGON CARIBBEAN FISHERY EXPLORATIONS 1955-1967,
Harvey R. Bullis, Jr., and John R. Thompson. 1972, 5p NOAA-72082129
Pub. in Proceedings of Symposium on Investigations and Resources of the Caribbean Sea and Adjacent Regions. (UNESCO) 1972 p17-20.

Descriptors: (*Fisheries, Caribbean Sea), Fishing grounds, Fishes, Distribution (Property), Resources, Surveys.
Identifiers: Fish surveys, Fishing gear, Tropical West Atlantic Ocean.

The report presents brief summaries of information obtained on exploratory cruises made since 1955 by the 'Bureau of Commerce Fisheries' vessel Oregon, a chartered vessel, 'Silver Bay' and 'Oregon II'. The Caribbean was divided into four general areas and the potentials of each area noted in a data summary figure. An assessment of the fishery resources in each area indicates method of investigation and the fishes available. The areas investigated were: Area I Yucatan Channel to the Canal Zone; Area II Canal Zone to Margarita Island (Venezuela); Area III Cuba to the Virgin Islands; Area IV Windward and Leeward Islands.

COM-72-11321 Reprint
Bureau of Commercial Fisheries, Pascagoula, Miss. Exploratory Fishing and Gear Research Base.
AERIAL REMOTE SENSING RECONNAISSANCE OF SURFACE SCHOOLING FISH,
Kirby L. Drennan, and Harvey R. Bullis, Jr. 1972, 4p NOAA-72082127
Pub. in Proceedings of Symposium on Investigations and Resources of the Caribbean Sea and Adjacent Regions. (UNESCO) 1972 p41-43.

Descriptors: (*Fishing grounds, *Remote sensing), Fishes, Aerial photography, Photogrammetry, Bioluminescence, Airborne equipment, Measurements, Instrumentation.
Identifiers: Fishing gear, Fish schools, Fish surveys.

Reports on the Aerial Fishery Survey Program begun in 1966 and directed toward the application of remote sensing technology to the problem of pelagic fishery resource assessment are presented. Studies using aerial photography, multispectral photographic studies, spectral reflectance measurements and bioluminescence studies are reviewed. Remote sensing systems expected to evolve will have both day time and night time sensing capabilities. It is concluded that the impact of airborne/spaceborne sensing systems on commercial fishing would be dramatic. It would be possible to predict when and where various species of fish could be taken at lowest cost.

COM-72-11325 PC$3.00/MF$0.95
Colorado Dept. of Natural Resources, Denver.
REPRODUCTIVE ENDOCRINOLOGY OF FISHES,
Carl B. Schreck. Jun 72, 102p NOAA-72092026
Grant NMFS-6-11-D
Prepared in cooperation with Colorado State Univ., Fort Collins. Doctoral thesis.

Descriptors: (*Fishes, *Reproduction (Biology)), (*Endocrinology, Fishes), Fisheries, Aquaculture, Physiology, Sex hormones, Trout.
Identifiers: Goldfishes, Carassius auratus, Salmo gairdneri, Cyprinus carpio.

Knowledge of the physiology of reproduction in fishes may find practical application in fish husbandry and management. This report establishes information concerning sex steroid hormones and their possible activities and target sites in teleosts.

COM-72-11326 PC$3.00/MF$0.95
Washington State Dept. of Fisheries, Olympia.
STREAM CATALOG - PUGET SOUND AND CHEHALIS REGION.
Completion rept. Jul 69-Jun 71,
R. Walter Williams, Richard M. Laramie, and James J. Ames. Mar 72, 73p NOAA-72091996

Descriptors: (*Streams, Habitability), (*Fisheries, Washington (State)), Animal ecology, Indexes (Documentation), Watersheds, Salmon, Pudget Sound.

A Stream Catalog of the Puget Sound and Chehalis Basins has been compiled in a rough draft form by the Aquatic Environmental Management Section of the Washington Department of Fisheries. This Catalog brings together all available physical descriptions and data concerning the individual rivers, tributary streams and adjacent lands, as well as present status data through 1970, associated with the various salmon species and stream habitat utilization by each species. This inter-relationship of stream physical conditions and present status of fish populations for each watershed is information vitally needed for sound management of these natural resources to insure perpetuation under the heavy demands projected beyond 1980. A numbering system for all Puget Sound rivers and streams was developed as an outgrowth of the needs of this catalog. (Author)

COM-72-11329 PC$3.00/MF$0.95
Tennessee Game and Fish Commission, Nashville.
INVESTIGATIONS OF PARASITES AND DISEASES OF CULTURED FISHES.
Completion rept. Jun 70-May 71,
W. A. Rogers, J. A. Plumb, J. L. Gaines, and R. P. Phelps. Jul 71, 11p NOAA-72091982
Grant NMFS-4-72-R
Prepared in cooperation with Auburn Univ., Ala.

Descriptors: (*Fisheries, *Infectious diseases), (*Parasitic diseases, Fisheries), Aquaculture, Animal diseases, Protozoal diseases, Bacterial diseases, Viral diseases, Bactericides, Disinfectants, Chemical compounds, pH, Temperature, Water.

Thirty-seven cases from commercial catfish operations were diagnosed for disease-producing organisms. Various chemicals useful in controlling diseases and parasites were studied in the laboratory under varying conditions of pH, hardness, and temperature to determine toxicity and efficacy.

COM-72-11330 PC$3.00/MF$0.95
Alabama Dept. of Conservation and Natural Resources, Montgomery.
SHELL PLANTING FOR OYSTER CULTCH.
Completion rept. May 66-Feb 67,
Johnie H. Crance. Feb 67, 3p NOAA-72091990
Grant NMFS-2-30-D

Descriptors: (*Oysters, Fisheries), Reefs, Renovating, Alabama.
Identifiers: Oyster shells, Oyster cultch, Mobile Bay.

A total of 37,309 barrels of oyster shells were planted on Point Clear reef in Mobile Bay, Alabama in 1966. (Author)

COM-72-11335 PC$3.00/MF$0.95
Missouri Dept. of Conservation, Jefferson City.
STUDIES ON THE TRANSMISSION OF 'PLISTOPHORA OVARIAE', AN OVARY PARASITE OF THE GOLDEN SHINER.
Completion rept. Mar 70-Jun 71,
Robert C. Summerfelt. Mar 72, 21p NOAA-72091988
Grant NMFS-4-66-R

Descriptors: (*Protozoa, *Minnows), (*Parasitic diseases, Fishes), Spores, Life cycles, Ingestion (Biology), Ovary.
Identifiers: Pleistophora ovariae, Notemigonus crysoleucas, Golden shiner minnows.

Experimental transmission of Pleistophora ovariae was undertaken by peroral transmission. Transovarian transmission was proven to the extent that the parasite was observed in the yolk of the blastulas from infected parents. The experiment demonstrated that peroral transmission was the probable major mode of transmission.

COM-72-11339 PC$3.00/MF$0.95
Washington State Dept. of Fisheries, Olympia.
LARVAL AND ESTUARIAL STUDIES, PINK AND CHUM SALMON POPULATIONS.
Completion rept. Jan 67-Dec 69,
Ray C. Johnson. Feb 70, 41p NOAA-72092025
Grant NMFS-1-40-R

Descriptors: (*Salmon, *Fisheries), Estuaries, Animal ecology, Mortality, Larvae, Abundance, Washington (State), Puget Sound, Hydrology.
Identifiers: Oncorhynchus keta, Oncorhynchus gorbuscha, Pink salmon, Chum salmon.

Larval and estuarial studies involved three phases of work: (1) hydraulic sampling, (2) estuarial studies, and (3) environmental data analysis. Chum salmon alevin abundance is compared for 5 years, and projections for relative size of returning runs have been made for 1970 and 1971. Fry density in 1969 (1968 brood) was generally improved over prior years and some increase in numbers of returning 3-year-old adults is anticipated in 1971.

COM-72-11340 PC$3.00/MF$0.95
Oregon Fish Commission, Portland.
SHAD AND STRIPED BASS MANAGEMENT STUDY.
Completion rept. Mar 68-Jun 70,
Edwin T. Cummings. Aug 70, 81p NOAA-72092007

Descriptors: (*Bass, Management analysis), (*Oregon, Bass), Age, Marking, Reproduction (Biology), Fishing.
Identifiers: Alosa sapidissima, Roccus saxatilis, *Shad.

Scales and data on length, sex, and weight were collected from striped bass of the Coos and Umpqua river systems. Scales and data on length, sex, and weight were collected from American shad of the Siuslaw, Smith, Umpqua, Coos, and Coquille Rivers. Population estimates of shad available to commercial nets were made in Coos Bay, and the Smith and Umpqua Rivers. Numbers of shad and striped bass landed by commercial fishermen are summarized. (Author)

COM-72-11341 Reprint
Maryland Fish and Wildlife Administration, Annapolis.
IMMUNODIFFUSION--A TECHNIQUE FOR COELENTERATE POLYP IDENTIFICATION,
J. W. Burnett, and W. M. Gould. 17 Mar 71, 4p NOAA-72091980
Prepared in cooperation with Maryland Univ., Baltimore. School of Medicine.
Pub. in Comparative Biochemistry and Physiology, A. Comparative Physiology (England), v40A p855-857 1971.

Descriptors: (*Coelenterata, Identifying), Venoms, Antigens, Immune serums, Immunology, Toxins and antitoxins, Chesapeake Bay.
Identifiers: Immunodiffusion, Chrysaora quinquecirrha, Aurelia aurita, Cyanea capillata, *Jellyfish, Sea nettles.

An immunodiffusion test can identify Chrysaora quinquecirrha polyps and differentiate them from the polyps of Cyanea capillata which are also found in the Chesapeake Bay. The polyps of Aurelia aurita and Chrysaora contain antigenic material which form lines of identity when tested with anti-Chrysaora serum.

COM-72-11342 PC$3.00/MF$0.95
Louisiana Wild Life and Fisheries Commission, New Orleans.
SHELL PLANTING FOR OYSTER CULTCH.
Completion rept. May-Jun 67,
Max Summers. Oct 67, 10p NOAA-72092017
Grant NMFS-2-54-D

Descriptors: (*Oysters, *Aquaculture), (*Fisheries, *Louisiana), Rivers, Rehabilitation, Inspection.

A total of 33,333 cubic yards of clam shells were planted in 1967 on 1,049 acres of natural oyster producing areas in St. Bernard Parish and Plaquemines Parish, Louisiana. (Author)

COM-72-11343 PC$3.00/MF$0.95
Washington State Dept. of Fisheries, Olympia.
EVALUATION OF DRY FEED FOR HATCHERY SALMON.
Completion rept. Aug 70-Jun 71,
Richard Westgard. Sep 71, 16p NOAA-72092012
Grant NMFS-1-73-D

Descriptors: (*Fisheries, Feeding stuffs), (*Salmon, Feeding stuffs), Animal ecology, Ponds, Diets.
Identifiers: Chinook salmon, Coho salmon.

The continued testing of dry diets for salmon indicates that environmental factors limits the degree of success to a greater extent than the ingredients per se as used in the Abernathy diet. The Abernathy dry diet is capable of raising both chinook and coho, however, the fish on this diet have less tolerance to environmental stresses than do those fed Oregon Moist Pellets. Pond design, feeding rates, feeding frequency, stocking rate, and general fish cultural practices are much more critical when using a dry ration. (Author)

COM-72-11344 PC$3.00/MF$0.95
Oregon Fish Commission, Portland.
MANAGEMENT OF THE TROLL SALMON FISHERY.
Completion rept. Jul 66-Jun 70,
Paul H. Reed. Aug 70, 173p NOAA-72092005

Descriptors: (*Salmon, Fisheries), (*Fisheries, *Oregon), Sampling, Age, Marking, Mortality, Statistical data.
Identifiers: Chinook salmon, Coho salmon.

The troll salmon program includes (1) annually conducted activities such as collecting processing, and analyzing catch statistics, age composition, and mark sampling information, and (2) periodic short-term studies on subjects such as the incidence of non-legal salmon in commercial catches, and hooking mortality. (Author)

COM-72-11346 PC$3.00/MF$0.95
Washington State Dept. of Fisheries, Olympia.
SUBTIDAL HARDSHELL CLAM FISHERIES INVESTIGATIONS.
Completion rept. Apr 67-Jun 71,
Lynn Goodwin. Aug 70, 40p NOAA-72092002
Grant NMFS-1-42-D

Descriptors: (*Clams, Biological surveys), (*Fisheries, *Pudget Sound), Animal ecology, Larvae, Growth, Temperature, Salinity, Washington (State).
Identifiers: Panope generosa, Juan de Fuca Strait.

Exploratory hard-shell clam surveys were completed in several locations in the Strait of Juan de Fuca and central Puget Sound. Four commercially important beds of these clams were found. An estimated 13 million more geoducks have been found in 6,441 acres of subtidal bottom bringing the total area found with geoducks during the entire project to 25,223 acres with an estimated 51 million geoducks. Growth studies indicate that these clams grow rapidly the first few years of life (up to 30 mm/year). This rate is higher than formerly believed. Experiments conducted in the past year indicate that the temperature and salinity tolerances for geoduck embryos are 6-16-C and 25-32.5 0/00, respectively. (Author)

COM-72-11347 PC$3.00/MF$0.95
Alabama Dept. of Conservation and Natural Resources, Montgomery.
RESTORATION OF ALABAMA'S PUBLIC OYSTER REEFS DAMAGED BY HURRICANE CAMILLE.
Completion rept. Oct 69-Sep 70,

Johnie H. Crance. Sep 70, 3p NOAA-72092013
Grant NMFS-2-102-D (4b)

Descriptors: (*Oysters, Reefs), (*Reefs, *Alabama), Renovating, Damage, Fisheries.

The planting of 8,000 barrels of clam shells near Cedar Point, Alabama restored cultch destroyed by Hurricane Camille. (Author)

COM-72-11348 PC$3.00/MF$0.95
Oregon Fish Commission, Portland.
HATCH, REAR, AND RELEASE SALMONIDS AT THE ELK RIVER SALMON HATCHERY.
Completion rept. Sep 68-Jun 70,
Ernest R. Jeffries. Jul 70, 6p NOAA-72092020

Descriptors: (*Salmon, Fisheries), (*Trout, Fisheries), (*Fisheries, Oregon), Aquaculture, Growth, Fishes, Rivers, Ponds.
Identifiers: Chinook salmon, Coho salmon, Steelhead trout, Hatcheries, Elk River, Oncorhynchus kisutch, Oncorhynchus tshawytscha, Salmo gairdnerii.

The production of fall chinook and coho salmon and steelhead trout is summarized for the period September 1968-June 1970 at the Elk River Salmon Hatchery in Oregon.

COM-72-11349 PC$3.00/MF$0.95
Alabama Dept. of Conservation and Natural Resources, Montgomery.
CONSTRUCTION OF PUBLIC OYSTER LANDING FACILITIES.
Completion rept. Apr 66-May 67,
Johnie H. Crance. May 67, 3p NOAA-72092011
Grant NMFS-2-29-C

Descriptors: (*Oysters, Unloading), (*Seafood, Handling equipment), Facilities, Fisheries, Alabama.
Identifiers: Mobile County (Alabama).

Three public facilities are reported for the unloading of oysters from boats to trucks in Mobile County, Alabama.

COM-72-11350 PC$3.00/MF$0.95
Oregon Fish Commission, Portland.
HATCH, REAR, AND RELEASE SALMONIDS AT THE NORTH NEHALEM RIVER SALMON HATCHERY.
Completion rept. Jan 68-Jun 70,
Ernest P. Jeffries. Jul 70, 9p NOAA-72092021

Descriptors: (*Salmon, Fisheries), (*Trout, Fisheries), (*Fisheries, Oregon), Aquaculture, Growth, Fishes, Rivers.
Identifiers: Steelhead trout, Coho salmon, Chinook salmon, Hatcheries, Oncorhynchus kisutch, Oncorhynchus tshawytscha, Salmo gairdnerii, North Nehalem River.

The production of fall chinook and coho salmon and steelhead trout is summarized for the North Nehalem River Salmon Hatchery, Oregon, for the period January 1968-June 1970.

COM-72-11352 PC$3.00/MF$0.95
Oregon Fish Commission, Portland.
RESEARCH AND MANAGEMENT ON WILD AND HATCHERY PRODUCED SALMON AND STEELHEAD IN OREGON SOUTH COASTAL STREAMS.
Completion rept. Oct 67-Jun 69,
Alan M. McGie. Oct 69, 97p NOAA-72092024

Descriptors: (*Salmon, Fisheries), (*Trout, Fisheries), (*Fisheries, Oregon), Aquaculture, Reproduction (Biology), Mortality, Animal migrations, Animal ecology, Lakes, Streams, Estuaries, Temperature, Salinity, Food habits.
Identifiers: Steelhead trout, Coho salmon, Chinook salmon, Hatcheries, Oncorhynchus kisutch, Oncorhynchus tshawytscha, Salmo gairdnerii.

The research activities included spawning ground surveys, physical stream surveys, investigations of fall chinook salmon, and estuary studies.

COM-72-11353 PC$3.00/MF$0.95
Alabama Dept. of Conservation and Natural Resources, Montgomery.
OYSTER REARING POND CONSTRUCTION.
Completion rept. Apr 66-Jan 68,
Johnie H. Crance. Jan 68, 3p NOAA-72092004
Grant NMFS-2-31-C

Descriptors: (*Oysters, Ponds), (*Ponds, Construction), Fisheries, Salt water, Aquaculture, Alabama.
Identifiers: Dauphin Island.

A 1/4 acre pond was constructed adjacent to the Alabama Marine Resources Laboratory on Dauphin Island, Alabama, to conduct research on the commercial rearing of oysters in saltwater ponds. (Author)

COM-72-11354 PC$3.00/MF$0.95
Oregon Fish Commission, Portland.
EFFECTS OF LOGGING ON SALMON POPULATION IN COASTAL STREAMS.
Completion rept. Jul 67-Jun 70,
David W. K. Au. Aug 70, 65p NOAA-72091986
Prepared in cooperation with Oregon State Univ., Corvallis.

Descriptors: (*Salmon, Fisheries), (*Streams, *Lumbering), Habitability, Stream pollution, Stream flow, Suspended sediments, Temperature, Dissolved gases, Oxygen, Water chemistry, Animal ecology, Oregon.

The study involves an investigation of environmental and biotic changes which have resulted from logging operations in the Alsea River watershed in Oregon. A particular concern is the response of coho salmon populations to environmental modification. (Author)

COM-72-11355 PC$3.00/MF$0.95
California State Dept. of Fish and Game, Sacramento.
MAD RIVER HATCHERY FISH LADDER CONSTRUCTION.
Completion rept. Jun 67-Jun 70,
C. S. Kabel. Jul 71, 5p NOAA-72091987

Descriptors: (*Fishways, Construction), (*Aquaculture, California), Animal migrations, Trout, Salmon, Fisheries, Reviews.
Identifiers: *Fish ladders, Mad River, Humboldt County (California).

A report is made on a fishway which was constructed on Mad River, Humboldt County, California, to provide passage for adult king salmon, coho salmon, and rainbow trout to the Mad River fish hatchery.

COM-72-11357 Reprint
Bureau of Commercial Fisheries, Pascagoula, Miss. Exploratory Fishing and Gear Research Base.
FISHERY POTENTIAL FOR SNAPPER AND GROUPER IN THE CARIBBEAN AREA AND THE GUIANAS,
James S. Carpenter, and Walter R. Nelson. 1972, 7p NOAA-72082128
Pub. in Proceedings of Symposium on Investigations and Resources of the Caribbean Sea and Adjacent Regions. (UNESCO) 1972 p21-26.

Descriptors: (*Fishes, *Caribbean Sea), Fishing grounds, South America, Atlantic Ocean, Nicaragua, Honduras, Fisheries, Marine fishes, Abundance.
Identifiers: Fishing gear, *Guiana, Snappers, Groupers.

The report briefly reviews information on snapper and grouper abundance and availability in the Caribbean Sea and the Guianas. The principal commercial species taken by the R.V. Oregon are tabulated with their common names, main adult depth range, and occurrence in specific areas. Abundance estimates for selected areas indicate a latent snapper and grouper resource for the Caribbean on the order of 41,000 t, many times the amount taken presently. The area of greatest fishery potential appears to be the shelf and bank complex off Honduras and Nicaragua.

COM-72-11360 PC$3.00/MF$0.95
Fish and Wildlife Service, Washington, D.C.
THE FISH AND FISHERIES OF COLONIAL NORTH AMERICA. A DOCUMENTARY HISTORY OF THE FISHERY RESOURCES OF THE UNITED STATES AND CANADA. PART IX. THE PACIFIC COAST,
John C. Pearson. 1972, 169p NOAA-72100307
See also Part 8, COM-72-11155.

Descriptors: (*Fisheries, *History), Abundance, Fishing, Regulations, Fishing grounds, Coasts, United States, Canada.

Observations and accounts of the origin and early development of the marine and fresh water fisheries of the United States are meagerly represented in contemporary historical literature. This publication gives information not only on the abundance of fish, methods of fishing, and exploitation of the fisheries but also on observations of the fisheries as they affected the lives of the Colonial fishermen. The chronological span of these documents covers about three centuries--from 1492 to around 1800. (Author)

COM-72-11362 Reprint
Connecticut Board of Fisheries and Game, Hartford.
NET AVOIDANCE BEHAVIOR IN AMERICAN SHAD ('ALOSA SAPIDISSIMA') AS OBSERVED BY ULTRASONIC TRACKING TECHNIQUES,
Robert A. Jones, and William C. Leggett. 21 Dec 70, 6p NOAA-72092000
Prepared in cooperation with Essex Marine Lab., Conn.
Pub. in Jnl. Fisheries Research Board of Canada, v28 n8 p1167-1171, 1971.

Descriptors: (*Fishes, Avoidance responses), (*Animal behavior, Tracking), Nets, Perception, Transmitters, Implantation, Ultrasonic radiation, Animal migrations.
Identifiers: Alosa sapidissima, Ultrasonic tracking, Connecticut River, Net avoidance, Shad.

During tracking of 13 adult American shad with implanted ultrasonic transmitters in 49 approaches to commercial drift gillnets in the lower Connecticut River, only one shad was captured. Shad were observed to move to within 1-2 m of the net before sensing its presence, then to turn and swim along the net, close to the mesh, to its end, where they turned and continued their upriver migration. A discussion is made of this behavior.

COM-72-11363 Reprint
Maryland Fish and Wildlife Administration, Annapolis.
AN ELECTRON MICROSCOPIC STUDY OF TWO NEMATOCYTES IN THE TENTACLE OF 'CYANEA CAPILLATA',
Joseph W. Burnett. 1971, 6p NOAA-72092027
Contract DI-14-17-007-959
Prepared in cooperation with Maryland Univ., Baltimore. School of Medicine.
Pub. in Chesapeake Science, v12 n2 p67-71 Jun 71.

Descriptors: (*Coelenterata, Electron microscopy), Anatomy, Morphology, Cells (Biology), Bites and stings.
Identifiers: *Nematocytes, Sea nettles, Jellyfish, Nematocysts, Cyanea capillata.

Two types of nematocytes were commonly found in the fishing tentacle of Cyanea capillata. One cell contained an unencysted thread coiled about its expanded proximal butt. This thread had barbs on its surface and was enclosed within a multilayered capsule. A nematocyst enclosing a thread with an expanded terminal bulb was also present. The coils of these threads were free in the cytoplasm. No barbs were present on these structures.

COM-72-11364 Reprint
Kansas Forestry, Fish and Game Commission, Pratt.
WHAT KIND OF FEED IS BEST FOR GROWING CATFISH,
O. W. Tiemeier, and C. W. Deyoe. 1972, 4p NOAA-72090834
Grant NMFS-4-45-R
Pub. in Fish Farming Industries, 4p Apr 72.

Descriptors: (*Catfishes, Feeding stuffs), Animal nutrition, Body weight, Proteins, Tables (Data).
Identifiers: *Channel catfish.

Experiments on the nutritional requirements of channel catfish two years of age indicated that the greatest weight gains were obtained using Z-42, a 30 percent protein feed. Rate of conversion was best (1.57) feeding Z-14 at 1.5 percent of the body weight daily. Generally, however, fish in regimens fed at 2 percent gained more weight than those fed at 1.5 percent daily. (Author)

COM-72-11365 Reprint
Skidaway Inst. of Oceanography, Savannah, Ga.
INTERACTIONS OF FEEDING RATES AND ENVIRONMENTAL TEMPERATURE ON GROWTH, FOOD CONVERSION, AND BODY COMPOSITION OF CHANNEL CATFISH,
James W. Andrews, and Robert R. Stickney. 1972, 8p NOAA-72090835
Grant NMFS-2-84-R
Sponsored in part by Georgia Game and Fish Commission, Brunswick, and Cotton Producers Association. National Marine Fisheries Service.
Pub. in Transactions of the American Fisheries Society, v101 n1 p94-99 Jan 72.

Descriptors: (*Catfishes, Growth), Feeding habits, Body composition, Temperature, Digestion, Metabolism, Aquaculture.
Identifiers: Ictalurus punctatus, *Channel catfish.

Channel catfish (Ictalurus punctatus) fingerlings were maintained in 20-gallon glass aquaria at 18, 22, 26, 30 and 34 C. Duplicate groups at each temperature were fed 2, 4, and 6% of their biomass daily. After 12 weeks sample fish from each group were sacrificed and analyzed for total body lipid content and fatty acid composition. Highest gains and the best food conversion ratios were achieved at 30 C. Substantial gains were noted at 26 and 34 C with lesser growth at 18 and 22 C. At all temperatures a feeding rate of 4% of biomass daily was sufficient for rapid growth. (Author)

COM-72-11376 Reprint
Virginia Inst. of Marine Science, Gloucester Point.
NEMATOCYSTS OF POLYPS OF 'AURELIA', 'CHRYSAORA', AND 'CYANEA', AND THEIR UTILITY IN IDENTIFICATION,
Dale R. Calder. 1971, 9p Contrib-398 NOAA-72091999
Contract DI-14-17-0007-961
Pub. in Transactions of American Microscopical Society, v90 n3 p269-274 1971.

Descriptors: (*Coelenterata, Identifying), Anatomy, Morphology, Chesapeake Bay, Microscopy, Bites and stings.
Identifiers: *Nematocysts, Sea nettles, *Jellyfish, Aurelia aurita, Chrysaora quinquecirrha, Cyanea capillata.

Nematocysts in known scyphistomae of Aurelia aurita, Chrysaora quinquecirrha, and Cyanea capillata were examined to determine possible specific differences in caidome or in morphology of a given nematocyst type.

COM-72-11379 PC$6.00/MF$0.95
North Carolina Div. of Commercial and Sports Fisheries, Raleigh.
THE STATUS, ABUNDANCE, AND EXPLOITATION OF STRIPED BASS IN THE ROANOKE RIVER AND ALBEMARLE SOUND, NORTH CAROLINA, AND THE SPAWNING OF STRIPED BASS IN THE TAR RIVER, NORTH CAROLINA.
Completion rept. Feb 67-Jan 70,
William W. Hassler, and William T. Hogarth. Jun 70, 346p NOAA-72053115
Prepared in cooperation with North Carolina State Univ., Raleigh.

Descriptors: (*Bass, Abundance), (*North Carolina, Bass), Fisheries, Rivers, Eggs, Sampling, Reproduction (Biology), Statistical data.
Identifiers: Roccus saxatilis, Albemarle Sound, Roanoke River, Tar River.

The basic aim of this study is to provide data on the status of the striped bass (Roccus saxatilis) population in Roanoke River and Albemarle Sound, North Carolina, so that a decline in abundance of this resource may be detected sufficiently early to prevent any permanent damage to the striped bass population. Young-of-year striped bass were sampled in Albemarle Sound from 1955 to 1969. Peak years of abundance of young-of-year striped bass have been followed by an average of two years with lower mean catches. From 1956 to 1969, 7,182 striped bass were tagged in Roanoke River and Albemarle Sound. Of these, 2,166 have been recovered. The estimate of 3,229,715,526 striped bass eggs in Roanoke River in 1969 is the highest on record. (Author)

COM-72-11385 Reprint
National Marine Fisheries Service, Oxford, Md. North Atlantic Coastal Fisheries Research Center.
'MINCHINIA NELSONI' IN OYSTERS FROM MASSACHUSETTS WATERS,
George E. Krantz, Lucretia R. Buchanan, C. Austin Farley, and H. Arnold Carr. 1972, 8p NOAA-72091617
Prepared in cooperation with Commonwealth of Massachusetts, Sandwich. Div. of Marine Fisheries.
Pub. in Proceedings of the National Shellfisheries Association, v62 p83-85 Jun 72.

Descriptors: (*Protozoa, *Oysters), (*Parasites, Oysters), Shellfish, Fisheries, Histology, Pathology, Epidemiology, Massachusetts, Distribution (Property).
Identifiers: Crassostrea virginica, Minchinia nelsoni, Wellfleet Harbor.

Minchinia nelsoni was detected in oysters (Crassostrea virginica) in Wellfleet Harbor, Massachusetts, but was not found in oysters from 12 adjacent areas in the state. The finding is an extension of the geographic range of this parasite. Knowledge of shellfish management practices, substantiated by histological study of native and imported oysters, suggests that M. nelsoni was established in the Wellfleet Harbor oyster population through introduction of diseased oysters from other areas. (Author)

COM-72-11386 Reprint
National Weather Service, Austin, Tex.
DRY, HOT WINDS IN TEXAS,
Robert Orton. 1972, 5p NOAA-72091618
Pub. in Texas Agricultural Progress, v18 n2 p16-19 1972 TAP 627.

Descriptors: (*Plants (Botany), Climatology), (*Wind (Meteorology), Plants (Botany)), Plant ecology, Humidity, Temperature, Texas.

The report describes the effects of dry hot winds on plants in Texas. They are defined as the simultaneous occurrence of relative humidity less than 30 percent, wind speed 15 mph or greater, and air temperature equal to or greater than 75F. These values are close to those which define the Russian sukhovei. Plant-weather relationships are discussed. (Author)

COM-72-11388 Reprint
National Marine Fisheries Service, Galveston, Tex. Biological Lab.
EXPERIMENTAL TECHNIQUES FOR PRESERVING DIATOMS USED AS FOOD FOR LARVAL 'PENAEUS AZTECUS',
Ausbon Brown, Jr. 1972, 10p Contrib-330 NOAA-72091625
Pub. in Proceedings of the National Shellfisheries Association, v62 p21-25 Jun 72.

Descriptors: (*Diatoms, Preservation), (*Feeding stuffs, Diatoms), (*Shrimps, Diatoms), Larvae, Algae, Aquaculture, Food, Freeze drying.
Identifiers: Penaeus aztecus, Skeletonema costatum, *Brown shrimp.

The diatoms Skeletonema costatus and Thalassiosira sp. were freeze-dried and fed to larval brown shrimp, Penaeus aztecus, being reared to first stage mysis from first stage protozea. Feeding levels ranged from 100,000-1,000,000 cells/ml. Both diatoms were also frozen, either in the presence or absence of the protectants glycerol and dimethyl sulfoxide. Frozen Skeletonema was suitable when frozen in the presence of protectants; Thalassiosira supported good growth of larval shrimp when frozen alone or with protectants. Although neither frozen nor freeze-dried foods were as good as live diatoms at equal concentrations, these foods may be used supplementally to eliminate complete dependence on live algal cultures. (Author)

COM-72-11389 PC$3.00/MF$0.95
Alaska Dept. of Fish and Game, Juneau.
ALASKA CATCH AND PRODUCTION COMMERCIAL FISHERIES STATISTICS--1967,
Richard C. Nelson. Dec 71, 33p Statistical Leaflet-15 NOAA-72042109
Contract DI-14-17-0007-731, Grant NMFS-5-3-D

Descriptors: (*Alaska, *Fisheries), Fishes, Statistical analysis, Shellfish, Salmon, Trout, Crabs, Shrimps, Clams, Herrings, Oysters.

Statistics are presented showing catch and production for Alaska commercial fisheries in 1967.

N72-28045 PC$3.25/MF$0.95
Texas Univ., Houston. School of Public Health.
CULEX QUINQUEFASCIATUS BREEDING SITES.
Quarterly Report, 3 Apr. - 4 Jul. 1972
4 Jul 72, 25p NASA-CR-115708, QR-1
Contract NAS9-12696

Descriptors: *Bioassay, *Ecology, *Reproduction, *Culex, Bioinstrumentation, Ground truth, Remote sensors.

For abstract, see STAR 10 19.

N72-30116 PC$3.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
LASER MICROSPECTRAL ANALYSIS OF BIOLOGICAL OBJECTS.
G. Dimitrov. Aug 72, 13p NASA-TT-F-14353
Tran- Transl. Into English From Godishnik Sofiakiya Univ., Fiz. Fak. (Bulgaria), V. 63, 1968-1969 (Published in 1971)P 123-135

Descriptors: *Bioassay, *Human beings, *Inorganic compounds, *Insects, *Lasers, *Pigments, Metals, Microanalysis, Spectrum analysis.

For abstract, see STAR 10 21.

TT-72-50003 PC$6.00/MF$0.95
Smithsonian Institution, Washington, D.C.
FLORA OF THE U.S.S.R. VOLUME 24. DIPSACACEAE, CUCURBITACEAE, CAMPANULACEAE.
B. K. Shishkin. 1972, 395p
Trans. of Akademiya Nauk SSR. Botanicheskii Institut. Flora S.S.S.R., v24 484p 1957, by R. Lavoott. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program. International Standard Book No. 0-7065-1254-5.

Descriptors: (*Plants (Botany), Taxonomy), Identifying, Classifications, Translations, Distribution (Property), USSR.
Identifiers: *Dipsacaceae, *Curcurbitaceae, *Campanulaceae.

Contents:
Indexes;
Families morinaceae, Dipsacaceae;
Family cucurbitaceae;
Family campanulaceae;
Family lobeliceae.

6D. Bionics

N72-28096 PC$10.50/MF$0.95
Nauka Press, Moscow (USSR.
BIONICS BIBLIOGRAPHIC INDEX OF THE DOMESTIC AND FOREIGN LITERATURE, 1958-1968.
T. N. Anisimova. 1971, 168p

Descriptors: *Bibliographies, *Bionics, Biocontrol systems, Biological effects, Cybernetics, Pattern recognition, Receptors (physiology).

For abstract, see STAR 10 19.

N72-28204 PC$6.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
SPEED IN INFORMATION PROCESSING WITH A COMPUTER DRIVEN VISUAL DISPLAY IN A REAL-TIME DIGITAL SIMULATION.
M.S. Thesis - Virginia Polytechnic Inst.
R. G. Kyle. Jun 72, 79p NASA-TM-X-68684

Descriptors: *Cathode ray tubes, *Data processing, *Display devices, *Human performance, Computerized simulation, Decision making, Matrices (mathematics), Numerical analysis, Real time operation.

For abstract, see STAR 10 19.

6E. Clinical Medicine

AD-750 312 PC$3.00/MF$0.95
Army Medical Research Lab Fort Knox Ky
THE AUTOMATED DITHIONITE TEST FOR THE DETECTION OF HEMOGLOBIN S IN MILITARY PERSONNEL. A TECHNIC EVOLVED FROM MOLECULAR CONCEPTS,
Frank R. Camp, Jr., Nicholas F. Conte, and Robert M. Nalbandian. 1972, 14p

Descriptors: (*Anemias, Diagnosis), (*Blood diseases, Diagnosis), (*Hemoglobin, Army personnel), Chemical analysis, Blood, Electrophoresis, Population, Automation, Genetics, Diseases, Hematology.
Identifiers: *Sickle cell anemia, *Hemoglobin S, *Dithionite test.

Automated, inexpensive, mass screening technics for the detection of hemoglobin S in both military and civilian populations have been proven by extensive field tests. These automated mass screening technics permit, for the first time in the history of sickle cell disease, the development of accurate, compiled statistical data, including gene frequency, incidence, morbidity, and mortality. The use of automated, inexpensive, objective, molecular-based mass screening technics is an essential prior condition for the elimination of this genetic disease by appropriate genetic counseling.

AD-750 313 PC$3.00/MF$0.95
Edgewood Arsenal Md
THE PRE-CLINICAL DETECTION OF CHEMICAL MUTAGENS AND THEIR EVALUATION AS GENETIC HEALTH HAZARDS,
Robert L. Capizzi, and Bruno Papirmeister. 1972, 15p

Descriptors: (*Mutations, *Chemicals), Humans, Genetics, Public health, Exposure, Detection, Biological assay, Pesticides, Drugs, Air pollution, Markers.
Identifiers: *Mutagens.

Chemicals possessing a high degree of mutagenic activity have been used for a number of years as laboratory tools for elucidating basic genetic mechanisms. Recent attention, however, has focused on the potential human genetic health hazard posed by exposure to chemicals. Since a mutation represents a sudden and heritable change in genetic material, the exposure of human populations to mutagenic chemicals might account for certain diseases. It has been shown that certain environmental chemicals, food additives, pesticides, and drugs can be mutagenic, carcinogenic and/or teratogenic in subhuman species and in man. To date there are no standardized tests of chemical mutagenesis which would provide the definitive assessment of a chemical's potential to induce mutations in humans. This paper describes the development of a new host-mediated assay utilizing a mammalian cell indicator that is sensitive, reliable and reasonably easy to perform. The comparative advantages of this system over conventional methodology are discussed.

AD-750 339 PC$3.00/MF$0.95
Letterman Army Inst of Research San Francisco Calif
MANDIBULAR BONE CRAFTS WITH SURFACE DECALCIFIED BONE,
John C. Jones, Gilbert E. Lilly, Perry B. Hackett, and Donald B. Osbon. 1972, 13p

Descriptors: (*Head, Fractures (Bone)), (*Bone, Transplantation), Surgery, Wounds + injuries, Regeneration, Bone marrow, Experimental data, Dogs.
Identifiers: Mandible, Orthopedics.

Experimental studies on dogs are reported, comparing autologous marrow grafts with surface decalcified allogenic grafts and surface decalcified allogenic grafts with autologous marrow fragments. Findings indicate that mandibular bone grafts composed of a combination of surface decalcified allogenic bone and autologous marrow fragments may have advantages to grafts composed only of autologous marrow fragments.

AD-750 382 PC$3.00/MF$0.95
Edgewood Arsenal Md
A VACCINE AGAINST ORGANOPHOSPHORUS POISONING,
Ludwig A. Sternberger, Van M. Sim, William G. Kavanagh, John J. Cuculis, and Howard G. Meyers. 1972, 13p

Descriptors: (*Vaccines, *Organic phosphorus compounds), (*Nerve agents, Organic phosphorus compounds), Immunology, Poisoning, Antigens + antibodies, Proteins, Biochemistry, Enzymes.
Identifiers: Immunochemistry.

Immunization against nerve agents constitutes the first instance that vaccination against a synthetic chemical, not occurring in nature, has been found to be pharmacologically effective. It is hoped that immunohistochemically monitored refinements will make the procedure clinically safe.

AD-750 428 Reprint
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
AUTOMATED LEUKOCYTE RECOGNITION,
Ian T. Young. 1970, 8p
Contract DA-28-043-AMC-02536 (E)
Sponsored in part by National Institutes of Health, Bethesda, Md.
Availability: Pub. in Automated Cell Identification and Cell Sorting, 1970, p187-194.

Descriptors: (*Leukocytes, *Identification), Automation, Hematology, Computers, Cells (Biology), Optical images, Pattern recognition.

With the aid of chromaticity statistics white cells have been separated from red cells and background. The differentiation of the while cells may then be implemented by the feature set discussed by Mendelsohn and Prewitt: (1) optical density difference between nucleus and cytoplasm; (2) size of nucleus; (3) size of cytoplasm, and the addition of chromaticity measurements on the nucleus and cytoplasm.

AD-750 443 Reprint
Navy Medical Neuropsychiatric Research Unit San Diego Calif
TEMPORAL ARTERITIS -- WHY THE TEMPORAL ARTERY,
Richard Smith, and Donald Dalessio. 1972, 5p
Rept no. NMNRU-71-51
Availability: Pub. in Headache, v12 n1 p18-19 Apr 72.

Descriptors: (*Arteries, *Shock (Pathology)), (*Eyeglasses, Aging (Physiology)), Diseases, Cranial nerves, Head, Blood vessels, Females.
Identifiers: *Arteritis.

In an unselected series of patients we have observed that temporal arteritis occurs almost exclusively in those who have worn eye glasses for a number of years. It is suggested that the mechanical trauma produced by the wearing of eye glasses upon the temporal arteries may predispose them to this disease. (Author)

AD-750 459 Reprint
Naval Medical Research Inst Bethesda Md
SERUM POTASSIUM CHANGES AFTER SUCCINYLCHOLINE IN PATIENTS WITH ACUTE MASSIVE MUSCLE TRAUMA.
Medical research progress rept.,
Charles Kopriva, Jack Ratliff, J. Raymond Fletcher, Peter van Tassel, and Rex Stout. 18 Nov 70, 6p
Availability: Pub. in Anesthesiology, v34 n3 p246-249 Mar 71.

Descriptors: (*Skeletal muscle relaxants, Potassium), (*Anesthetics, *Skeletal muscle relaxants), Blood serum, Muscles, Wounds + injuries, Metabolism, Physiology.
Identifiers: *Succinylcholine, *Hyperkalemia.

The effect of intravenous succinylcholine on serum potassium was studied in 21 combat casualties receiving their first anesthesia within three hours of sustaining massive muscle trauma. In 20 of these patients, there were no statistically or physiologically significant increases in serum potassium. In one patient, an increase in serum potassium was apparent ten minutes afte injection of succinylcholine, progressing to a peak level of 6.2 mEq/1, 20 minutes after injection. It is uncertain whether succinylcholine caused the hyperkalemia in this patient. (Author)

AD-750 581 PC$3.00/MF$0.95
Army Medical Research Lab Fort Knox Ky

CARBON MONOXIDE AND THE BLOOD DONOR.
Final rept.,
James Williams, and Charles E. Shields. 30 Jun 72, 10p Rept no. USAMRL-993

Descriptors: (*Blood transfusions, *Carbon monoxide), Oxygen consumption, Blood, Exercise, Hemoglobin.
Identifiers: *Blood donors, Smoking, Hyperventilation.

Blood donors can significantly elevate their blood carbon monoxide (CO) level by smoking prior to donation. Binding of CO to hemoglobin is stronger than for oxygen so that there is a competitive loss of oxygen carrying capacity. CO levels tend to respond to the balance of oxygen and CO concentrations, so that normally a slow exchange with the room air will result in a decrease in the acutely-increased CO level caused by smoking. In volunteer studies wherein smoking was followed by hyperventilation with oxygen (100%) or a bout of exercise, CO levels decreased to a greater degree than in smokers not hyperventilated. Blood donors were subjected to a 3-4 min exercise prior to donation; CO level was found to have decreased more than in smokers who did not exercise, despite the observation that the CO level in nonsmokers tended to rise after donation. In addition, a greater number of subjects demonstrated a decrease in CO with exercise compared with other smoker or nonsmoker groups who did not exercise. (Author)

AD-750 823 Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
PULMONARY FUNCTION STUDIES IN 'PLASMODIUM FALCIPARUM' MALARIA.
Technical rept.,
Myron J. Tong, Thomas V. N. Ballantine, and David B. Youel. 21 Jan 72, 11p Rept no. NAMRU-2-TR-510
Availability: Pub. in American Review of Respiratory Disease, v106 p23-29 Jul 72.

Descriptors: (*Plasmodium, *Respiratory diseases), Parasitic diseases, Edema, Diplococcus, Lungs, Parasites.
Identifiers: *Malaria, Plasmodium falciparum, Pneumonia.

In three patients in whom pulmonary complications developed, a decrease in arterial oxygen tension, significant pulmonary shunting, decrease in compliance, and increase in total and resistive work were found. Pulmonary complications in malaria are pulmonary edema and secondary pneumonia, and the malaria parasite itself appears to be responsible for both lesions. (Author)

AD-750 825 Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
HYPERSPLENISM IN WILSON'S DISEASE.
Technical rept.,
G. Thomas Strickland, N-K. Chang, and William M. Beckner. 25 Jan 72, 11p Rept no. NAMRU-2-TR-509
Availability: Pub. in Gut, v13 p220-224 1972.

Descriptors: (*Metabolic diseases, Spleen), (*Spleen, Pathology), (*Hematology, Metabolic diseases), Liver, Copper, Metabolism, Anemias.
Identifiers: *Hepatolenticular degeneration, Cirrhosis, Pancytopenia.

Thirteen patients with Wilson's disease were compared with seven cirrhotic and 13 normal controls to define better the haematological abnormalities in this condition. Hypersplenism (anaemia, leukopenia, thrombocytopenia, and reduced cell survival) commonly occurred in patients with both Wilson;s disease and cirrhosis. These abnormalities correlated with splenic enlargement. Despite reduced haematocrits, red cell mass was greater in these two groups than in normal controls. Plasma volume and the body haematocrit/peripheral haematocrit ratios were also greater in patients with Wilson's disease and cirrhosis. Increased splenic sequestration of 51Cr-tagged red blood cells was not demonstrated in any subjects. The hypersplenism in patients with Wilson's disease is similar to that found in patients with cirrhosis from other causes. (Author)

AD-750 838 Reprint
Naval Medical Research Inst Bethesda Md
LETHAL ESCHERICHIA COLI SEPTICEMIA IN THE BABOON: ALPHA-ADRENERGIC INHIBITION OF INSULIN SECRETION AND ITS RELATIONSHIP TO THE DURATION OF SURVIVAL.
Medical research progress rept. no. 6,
Philip E. Cryer, Arnold G. Coran, Jonas Sode, Clifford M. Herman, and David L. Horwitz. 8 Feb 72, 20p
Revision of report dated 16 Aug 71.
Availability: Pub. in Jnl. of Laboratory and Clinical Medicine, v79 n4 p622-638 Apr 72.

Descriptors: (*Septicemia, *Insulin), (*Hyperglycemia, Septicemia), Escherichia coli, Infections, Glucose, Adrenal glands, Inhibition, Sympatholytic agents, Primates, Experimental data.

To clarify the mechanisms of septicemic hypoinsulinemia and septicemic hyperglycemia, the serum immunoreactive insulin and serum glucose responses to Escherichia coli septicemia produced during phenotolamine-induced alpha-adrenergic receptor blockage were measured in 7 baboons. Septicemic animals not given phentolamine were significantly hypoinsulinemic and hyperglycemic 15 minutes after E. coli injection. In contrast, during septicemia in alpha-adrenergic receptor blockaded baboons the mean serum immunoreactive insulin and glucose levels were not significantly different from those of control animals given saline rather than E. coli. Thus, alpha-adrenergic receptor blockade prevented both septicemic hypoinsulinemia and septicemic hyperglycemia. Furthermore, in 2 of 3 additional baboons given a single injection of phentolamine 20 minutes after E. coli injection, the depressed immunoreactive insulin levels increased and the elevated glucose values fell following phentolamine injection. Thus, the release of endogenous insulin aborted the developing hyperglycemia of septicemia indicating that septicemic hyperglycemia is not an obligatory response to factors other than insulin lack. (Author)

AD-750 881 Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
A MATHEMATICAL MODEL OF SOME HELMINTHIC INFECTIONS,
Warren M. Hirsch, and Ingemar Nasell. Mar 72, 37p
Contract N00014-67-A-0467-0004
Prepared in cooperation with Bell Telephone Labs., Inc., Murray Hill, N.J.
Availability: Pub. in Communications on Pure and Applied Mathematics, v25 p459-477 1972.

Descriptors: (*Parasitic diseases, Mathematical models), (*Worms, Parasitic diseases), Stochastic processes, Infectious diseases, Epidemiology, Control, Parasites, Initial value problems.
Identifiers: Markov processes.

The problem of main interest is to study properties of the mathematical model that shed light on the course of the infections being modeled and on the relative efficacy of various possible methods of eradication or control. This problem is discussed and the asymptotic behavior of the transition matrices is described. Epidemiological interpretations of the mathematical results are given.

JPRS-57197 PC$6.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
MEDICAL INFORMATION SYSTEM,
N. M. Amosov, N. G. Zaitsev, V. G. Melnikov, A. A. Popov, and V. P. Starchik. 6 Oct 72, 356p
Trans. of mono. Meditsinskaya Informatsionnaya Sistema, Kiev, 1971 307p.

Descriptors: (*Clinical medicine, *Information systems), Computers, Diagnosis, Diseases, Data processing, Medical records, Computer systems programs, Translations, USSR.
Identifiers: *Computer aided diagnosis, *Biomedical information systems.

The book investigates the use of mathematics, cybernetics, and computer technology in medical diagnoses.

JPRS-57256 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
SETTING UP, DEVELOPMENT, AND BASIC RESULTS OF WORK DONE BY THE SANITARY-EPIDEMIOLOGICAL SERVICE OF THE RSFSR DURING THE LAST 50 YEARS,
K. I. Akulov. 16 Oct 72, 10p
Trans. of Sovetskaya Meditsina (USSR) n11 p39-43 1967.

Descriptors: (*Public health, *Sanitation), Hygiene, Sanitary engineering, Infectious diseases, Epidemiology, Preventive medicine, USSR, History, Translations.

The article reviews the history of sanitary and epidemiological services in the RSFSR during the first 50 years of Soviet power.

N72-28032 PC$37.00
National Aeronautics and Space Administration, Washington, D.C.
A CUMULATIVE INDEX TO A CONTINUING BIBLIOGRAPHY ON AEROSPACE MEDICINE AND BIOLOGY, JANUARY 1972.
Jan 72, 699p NASA-SP-7011 (98)

Descriptors: *Aerospace medicine, *Bibliographies, *Biological effects, *Indexes (documentation), Abstracts, Aerospace environments, Manned space flight, Physiological effects, Psychological effects.

For abstract, see STAR 10 19.

N72-28053 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
ENDOCRINOLOGY THE EFFECT OF AGE ON HYPOCALCEMIA AND HYPOPHOSPHATEMIA.
G. Milhaud, A. Perault-staub, and M. S. Moukhtar. Jul 72, 8p NASA-TT-F-14358
Contract NASW-2035
Tran- Transl. Into English From Compt. Rend., AC-Ad. Sci., Ser. D (Paris), V. 264, 4 Jan. 1967, P 110-113

Descriptors: *Age factor, *Calcium metabolism, *Endocrine secretions, *Phosphorus metabolism, *Rats, Bioassay, Hemodynamic responses, Hypometabolism.

For abstract, see STAR 10 19.

N72-29081 PC$10.50/MF$0.95
Research Triangle Inst., Durham, N.C.
BIOMEDICAL RESEARCH AND AEROSPACE TECHNOLOGY APPLICATIONS.
31 Dec 71, 167p NASA-CR-127792
Contracts NASW-1950, NASW-2273

Descriptors: *Aerospace medicine, *Biomedical data, *Nasa programs, *Technology utilization, Aerospace sciences, Life sciences, Research projects.

For abstract, see STAR 10 20.

N72-29090 PC$3.75/MF$0.95
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Electron Physics.
ON THE OPTIMAL CHOICE OF SCATTERING FOILS FOR ELECTRON THERAPY.
A. Brahme. Jun 72, 31p TRITA-EPP-72-17
Subm- Submitted for Publication

Descriptors: *Electron scattering, *Energy dissipation, *Foils (materials), *Radiation therapy, Angular distribution, Bremsstrahlung, Elastic scattering, Electron beams, Energy distribution.

For abstract, see STAR 10 20.

N72-30054 PC$3.00
National Aeronautics and Space Administration, Washington, D.C.
AEROSPACE MEDICINE AND BIOLOGY A CONTINUING BIBLIOGRAPHY WITH INDEXES, SUPPLEMENT 103, MAY 1972.
Jun 72, 116p NASA-SP-7011 (103)

Descriptors: *Aerospace medicine, *Bibliographies, *Biological effects, *Indexes (documentation), Abstracts, Aerospace environments, Manned space flight, Physiological effects, Psychological effects.

For abstract, see STAR 10 21.

N72-30062 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
FUNDAMENTALS OF AVIATION MEDICINE.
A. A. Lavnikov. Jul 72, 297p NASA-TT-F-711
Contract NASW-2035
Tran- Transl. Into English of the Publ. Osnovy Aviatsionnoy Meditsiny Moscow, Military Press, 1971

Descriptors: *Aerospace medicine, *Human body, Anatomy, Earth atmosphere, Pilots (personnel).

For abstract, see STAR 10 21.

PB-212 445 PC$3.00/MF$0.95
Cornell Univ., New York. Medical Coll.
THE ONSET OF MYOCARDIAL INFARCTION AND SUDDEN CARDIAC DEATH - PROSPECTIVE STUDIES IN MIDDLE AGED MEN.
Annual rept. Jan-Dec 71,
Lawrence E. Hinkle, Jr. Feb 72, 70p NIH-NHLI-70-2069-A72
Contract PHS-70-2069

Descriptors: (*Myocardial infarction, *Mortality), (*Cardiac arrhythmias, Prognosis), Cardiovascular diseases, Electrocardiography, Aging (Biology), Males, Medical examination, Signs and symptoms.

A long-term prospective study of 200 high risk patients and 200 controls is being conducted using periodic, ambulatory 24-hour EKG recordings, physical exams, and various laboratory studies. This will establish the prognostic value of arrhythmias and heart rate during the normal life pattern and assess other risk factors as well.

PB-212 446 PC$3.00/MF$0.95
Johns Hopkins Univ., Baltimore, Md. School of Hygiene and Public Health.
THE ONSET OF MYOCARDIAL INFARCTION AND SUDDEN CARDIAC DEATH - PATHOLOGICAL AND RETROSPECTIVE HISTORY STUDY OF SUDDEN DEATH AND MYOCARDIAL INFARCTION IN A COMMUNITY.
Annual rept. Jan-Dec 71,
Lewis Kuller, Malcolm Cooper, and Yoshua Perper. 1 Feb 72, 110p NIH-NHLI-70-2071-A72
Contract PHS-70-2071

Descriptors: (*Myocardial infarction, *Mortality), (*Cardiovascular diseases, Epidemiology), Physiology, Pathology, Prognosis, Coronary artery disease, Demography, Signs and symptoms.

As part of a collaborative study, clinical-pathological correlations are investigated in victims of sudden cardiac death to elucidate risk factors, premonitory symptoms, potential pathophysiologic mechanisms, and underlying pathology. The risk factors and the epidemiology of sudden cardiac death will be compared against matched normals and patients hospitalized with coronary heart disease.

PB-212 447 PC$3.00/MF$0.95
Mount Zion Hospital and Medical Center, San Francisco, Calif. Harold Brunn Inst.
THE ONSET OF MYOCARDIAL INFARCTION AND SUDDEN CARDIAC DEATH: A CLINICAL PATHOLOGICAL CORRELATION.
Annual rept. Jan-Dec 71,
Friedman Meyer. Feb 72, 16p NIH-NHLI-70-2073-A72
Contract PH-70-2073

Descriptors: (*Myocardial infarction, *Mortality), Cardiovascular diseases, Pathology, Physiology, Epidemiology, Signs and symptoms, Behavior.

As part of a collaborative study, clinical-pathological correlations are investigated in victims of sudden cardiac death to elucidate risk factors, premonitory symptoms, potential pathophysiologic mechanisms, and underlying pathology. Special emphasis will be upon assessing behavioral patterns as risk factors.

PB-212 461 PC$3.00/MF$0.95
Emory Univ., Atlanta, Ga. School of Medicine.
THE ONSET OF MYOCARDIAL INFARCTION AND SUDDEN CARDIAC DEATH: OBSERVATIONS AT LARGE GATHERINGS IN ATHLETIC STADIA.
Annual rept. Jan-Dec 71,
Nanette K. Wenger. Feb 72, 23p NIH-NHLI-70-2070-A72
Contract PHS-70-2070

Descriptors: (*Myocardial infarction, *Mortality), Epidemiology, Cardiovascular diseases, Cardiac arrest, Cardiac arrhythmias, Electrocardiography, Stress (Psychology), Resuscitation, Therapy.
Identifiers: *Emergency medical care.

Cardiac resuscitation teams are stationed at the two major athletic stadia in Atlanta, Georgia, to be used for patients sustaining sudden cardiac death or apparent acute myocardial infarction during major athletic events. Objectives are to assess the feasibility of such teams for large crowds and to obtain early electrophysiologic data on patients sustaining these acute events.

PB-212 463 PC$3.00/MF$0.95
Duke Univ. Medical Center, Durham, N.C. Myocardial Infarction Research Unit.
MYOCARDIAL INFARCTION RESEARCH UNIT: COMPREHENSIVE CLINICAL AND LABORATORY RESEARCH.
Annual rept. Jan-Dec 71,
James Morris. Feb 72, 78p NIH-NHLI-43-67-1440-A72
Contract PH-43-67-1440

Descriptors: (*Myocardial infarction, Research), Therapy, Cardiovascular diseases, Electrocardiography, Biochemistry, Pathology, Physiology, Metabolism, Blood circulation, Diagnosis, Prognosis, Enzymes, Glycosides.

Clinical and laboratory investigations are conducted to provide a better understnading and more effective treatment of myocardial infarction. Patients with acute myocardial infarction are carefully characterized by clinical, hemodynamic, electrophysiologic, and biochemical parameters during and following hospitalization. In addition, the following specific topics are being studied: admission hemodynamics; prognostic indices; isoenzymes; intraventricular conduction disturbances; new patient monitoring systems; digital autofluoroscopy; blood clotting and fibrinolysis; evaluation of myocardial performance immediately following revascularization; anatomic physiologic and metabolic evaluation of coronary circulation after acute myocardial infarction; long-term follow-up studies; pathology support; data management support which includes image processing. (Author)

PB-212 464 PC$3.00/MF$0.95
Alabama Univ., Birmingham. Myocardial Infarction Research Unit.
MYOCARDIAL INFARCTION RESEARCH UNIT. COMPREHENSIVE CLINICAL AND LABORATORY RESEARCH.
Annual rept. Jan-Dec 71,
Charles E. Rackley. Feb 72, 151p PH-43-67-1441-A72
Contract PH-43-67-1441

Descriptors: (*Myocardial infarction, Research), Cardiovascular diseases, Coronary artery disease, Heart function tests, Cardiac arrhythmias, Heart block, Blood circulation, Surgery, Pathology, Physiology, Data processing.
Identifiers: Cardiac assist devices.

Clinical and laboratory investigations are conducted to provide a better understanding and more effective treatment of myocardial infarction. Patients with acute myocardial infarction are carefully characterized by clinical, hemodynamic, electrophysiologic, and biochemical parameters during and following hospitalization. In addition, the following specific topics are being studied: Natural history of acute myocardial infarction; thermographic patterns; alterations in filling pressures; response to drugs; indirect techniques; ultrasound; pre-infarction angina; arrhythmia studies; coronary artery bypass surgery; long-term medical and surgical follow-up; pathology studies; blood supply of human His bundle; von Bezold-Jerisch reflex; chronotropic pharmacology of morphine sulfate; multiple dipole electrocardiography; analysis of electrical activity of heart; data management support.

PB-212 493 PC$3.00/MF$0.95
Boston Univ., Mass. School of Medicine.
PROTECTING ISCHEMIC MYOCARDIUM, MINIMIZING INFARCT SIZE, AND ENHANCING MYOCARDIAL REPAIR. PHARMACOLOGICAL AND OTHER INTERVENTIONS IN THE DOG.
Annual rept. for Jul-Dec 71,
William B. Hood, Jr. Feb 72, 12p NIH-NHLI-71-2498-A72
Contract PHS-71-2498

Descriptors: (*Myocardial infarction, Therapy), (*Ischemia, Myocardial infarction), Cardiovascular diseases, Hypothermia, Hyperbaric oxygenation, Parenteral infusions, Fatty acids, Glucose, Potassium, Insulin, Metabolism, Experimental data, Dogs.

The local mechanical performance of ischemic, borderzone, and normal myocardium will be evaluated after coronary constriction in anesthetized animals. The effect of four interventions (hypothermia, glucose potassium insulin infusion, free fatty acid infusion, and hyperbaric oxygenation) on the performance of the borderzone and on subsequent infarct size will be determined. The goal is to develop interventions which will protect ischemic myocardium and minimize infarct size.

PB-212 494 PC$3.00/MF$0.95
Baylor Coll. of Medicine, Houston, Tex. Fondren-Brown Cardiovascular Research and Training Center.

PROTECTING ISCHEMIC MYOCARDIUM, MINIMIZING INFARCT SIZE, AND ENHANCING MYOCARDIAL REPAIR. BIOCHEMICAL AND MOLECULAR MECHANISMS IN CARDIAC ISCHEMIA.
Annual rept. Jun-Dec 71,
Arnold Schwartz. Feb 72, 51p NIH-NHLI-71-2493-A72
Contract PHS-71-2493

Descriptors: (*Myocardial infarction, *Ischemia), (*Biochemistry, Myocardial infarction), Cardiovascular diseases, Blood circulation, Metabolism, Anaerobic processes, Mitochondria, Hormones.

In experimental myocardial ischemia, studies will be conducted of membrane transport, the sodium potassium ATPase enzyme system, active cation transport, and transmembrane potential; the sarcotubular network and the cardiac relaxing system; the specific activity of myosin ATPase; and the derangements in energy producing capacities of heart mitochondria. Specific substrates, hormones, and ions will be assessed for their ability to minimize the size of ultimate infarct size. (Author)

PB-212 503 PC$3.00/MF$0.95
California Univ., San Diego, La Jolla. School of Medicine.
MYOCARDIAL INFARCTION RESEARCH UNIT. COMPREHENSIVE CLINICAL AND LABORATORY RESEARCH.
Annual rept. Jan-Dec 71,
John Ross, Jr., and Burton E. Sobel. Feb 72, 162p PH-43-68-1332-A72
Contract PH-43-68-1332
See also Annual report dated 1970, PB-198 564.

Descriptors: (*Myocardial infarction, Research), Heart, Pathology, Therapy, Pharmacology, Blood circulation, Shock (Pathology), Hypotension, Electrocardiography, Coronary artery disease, Biochemistry, Histology, Data processing.

Clinical and laboratory investigations are conducted to provide a better understanding and more effective treatment of myocardial infarction. Patients with acute myocardial infarction are carefully characterized by clinical, hemodynamic, electrophysiologic, and biochemical parameters during and following hospitalization. In addition, the following specific topics are being studied: systematic study and therapy of shock and profound failure including mechanical circulatory assist; regional pulmonary ventilation and perfusion; identification and management of high risk patients; hemoglobin affinity for oxygen; serum enzyme dynamics; coronary collaterals; factors affecting infarct size; myocardial revascularization; pathologic studies; data management support.

PB-212 524 PC$3.00/MF$0.95
Johns Hopkins Medical Institutions, Baltimore, Md. Myocardial Information Research Unit.
ANNUAL REPORT (1971),
Richard S. Ross. Feb 72, 89p PH-43-67-1444-A72
Contract PH-43-67-1444
See also report dated 31 Jan 71, PB-198 562.

Descriptors: (*Myocardial infarction, Research), Cardiovascular diseases, Electrocardiography, Biochemistry, Shock (Pathology), Prognosis, Coronary artery disease, Lipids, Fatty acids, Heart function tests, Physiology, Pathology, Surgery, Data processing.
Identifiers: Cardiac assist devices.

Clinical and laboratory investigations are conducted to provide a better understanding and more effective treatment of myocardial infarction. Patients with acute myocardial infarction are carefully characterized by clinical, hemodynamic, electrophysiologic, and biochemical parameters during and following hospitalization. In addition, the following specific topics are being studied: systematic study and therapy of shock and profound failure including mechanical circulatory assist; prognostic significance of coronary arteriography; regional myocardial blood flow; hemodynamic and electrophysiologic effects of hyperlipidemia; description and randomized controlled study of medical vs. surgical therapy for preinfarction syndrome; pathologic studies; data management support.

PB-212 525 PC$3.00/MF$0.95
Washington Univ., St. Louis, Mo. School of Medicine.
SUDDEN CARDIAC DEATH AND THE ONSET OF MYOCARDIAL INFARCTION. DEVELOPMENT OF AUTOMATIC RHYTHM ANALYSIS METHODS FROM 24-HOUR MAGNETIC TAPES.
Rept. for Jul-Dec 71,
G. Charles Oliver. Feb 72, 37p NIH-71-2481-A72
Contract PHS-71-2481

Descriptors: (*Myocardial infarction, Mortality), (*Cardiac arrhythmias, Computers), Coronary artery disease, Electrocardiography, Monitors, Therapy, Prophylaxis.
Identifiers: Computer aided diagnosis.

Periodic, ambulatory long-term EKG recordings with off-line computer analysis will be used to study ventricular arrhythmias in patients with known coronary heart disease and controls. The first year effort is focused on development of computer methods for rapid automatic off line analysis of electrocardiograms and of protocols for prophylactic therapeutic trials. (Author)

PB-212 567 PC$3.00/MF$0.95
Maine Medical Center, Portland.
PROTECTING ISCHEMIC MYOCARDIUM, MINIMIZING INFARCT SIZE, AND ENHANCING MYOCARDIAL REPAIR. MYOCARDIAL INFARCT SIZE IN EXPERIMENTAL CORONARY OCCLUSION IN THE PIG. I. LOCAL CATECHOLAMINES. II. SURFACE POTENTIAL INTEGRATION.
Annual rept. Jun-Dec 71,
C. V. Nelson. Feb 72, 15p NIH-NHLI-71-2495-A72
Contract PHS-71-2495

Descriptors: (*Myocardial infarction, Therapy), (*Ischemia, Myocardial infarction), (*Catecholamines, Myocardial infarction), Pharmacology, Drug therapy, Cardiovascular diseases, Physiology, Pathology, Experimental data, Swine.

The potential role of locally released catecholamines during myocardial ischemia will be assessed upon local myocardial cell necrosis in infarct size utilizing experimental occlusion in the pig. Pharmacological blocking agents will be tested for their ability to protect ischemic myocardium and minimize infarct size.

PB-212 666 PC$6.00/MF$0.95
New York Hospital-Cornell Medical Center, N.Y.
MYOCARDIAL INFARCTION RESEARCH UNIT. COMPREHENSIVE CLINICAL AND LABORATORY RESEARCH.
Annual rept. Jan-Dec 71,
Thomas Killip. Feb 72, 334p PH-43-67-1439-A72
Contract PH-43-67-1439

Descriptors: (*Myocardial infarction, Research), (*Coronary artery disease, Research), Cardiovascular drugs, Biochemistry, Electrocardiography, Cardiac arrhythmias, Heart function tests, Hematology, Pathology, Heart, Blood circulation, Lidocaine, Procaine amide.
Identifiers: Cardia assist devices.

Clinical and laboratory investigations are conducted to provide a better understanding and more effective treatment of myocardial infarction. Patients with acute myocardial infarction are carefully characterized by clinical, hemodynamic, electrophysiologic, and biochemical parameters during and following hospitalization. In addition, the following specific topics are being studied: systematic study and therapy of shock and profound failure including mechanical circulatory assist; post hospital follow-up; pharmacodynamics of digitalis glycosides, lidocaine and procaine amide; platelet function; plasma kallikrein system, hemoglobin affinity for oxygen; pathologic studies; data management support.

PB-212 693 PC$3.00/MF$0.95
California Univ., Los Angeles. School of Medicine.
QUANTIFYING THE SIZE OF ISCHEMIC, INFARCTED, AND/OR SCARRED MYOCARDIUM-METHODS SUITABLE FOR USE IN LIVING MAN. IDENTIFICATION OF REGIONAL MYOCARDIAL PERFUSION DEFECTS BY RADIOISOTOPE SCINTISCANNING.
Annual rept. Jul-Dec 71,
Leslie M. Eber, and Norman D. Poe. Feb 72, 29p NIH-NHLI-71-2491-A72

Descriptors: (*Myocardial infarction, *Radiopaque agents), Coronary artery disease, Radioactive isotopes, Diagnostic agents, Scintillation, Potassium isotopes, Cesium isotopes, Carbon isotopes, Cardiovascular system, Laboratory animals, Experimental data.
Identifiers: *Nuclear medicine, *Arteriography.

Nuclear medicine techniques, involving radioactive potassium (43K), cesium (129Cs), and carbon (11C), will be used in an attempt to delineate and quantify infarcted myocardium. When the techniques are validated in animal models, observations will be extended to man.

6F. Environmental Biology

AD-750 826 Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
A HANDY, INEXPENSIVE DEVICE FOR DISPENSING INSECTICIDE DUST AND GRANULES IN SMALL QUANTITIES,
J. L. McDonald. 1972, 1p Rept no. NAMRU-2-TR-515
Availability: Pub. in Mosquito News, v32 n2 Jun 72.

Descriptors: (*Insecticides, Distribution), Instrumentation, Containers.

Plastic squeeze bottles such as those used for dispensing mustard, mayonaise, or catsup have been found to be excellent dispensers for dispensing small quantities of insecticide dust or granules. The correct nozzle opening is obtained by cutting off the tip; the farther back the tip is cut off, the larger the opening. While holding the dispenser parallel to the floor and squeezing it an evenly distributed pattern of dust or granules emerges. Only one hand is required to operate it, and the small cone nose is perfect for introduction of dust or granules to cracks or crevices. The plastic dispensers cost very little, are readily available, and are very easy to fill.

N72-29050 PC$5.50/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
A PRELIMINARY INVESTIGATION OF THE ENVIRONMENTAL CONTROL AND LIFE SUPPORT SUBSYSTEMS (EC/LSS) FOR ANIMAL AND PLANT EXPERIMENT PAYLOADS.
H. B. Wells. 15 May 72, 69p NASA-TM-X-64678

Descriptors: *Environmental control, *Exobiology, *Life sciences, *Life support systems, *Payloads, Animals, Experimental design, Plants (botany), Water management.

For abstract, see STAR 10 20.

N72-30361 PC$3.00/MF$0.95
Interuniversitair Reactor Instituut, Delft (Netherlands).
MERCURY DISTRIBUTION LEVELS OBSERVED IN VARIOUS ECOSYSTEMS AS DETERMINED BY NEUTRON ACTIVATION ANALYSIS.
J. J. Degoey, J. P. Houtman, P. S. Tjioe, and J. H. Koeman. 1972, 20p IRI-133-72-04

Descriptors: *Contaminants, *Ecology, *Mercury (metal), *Netherlands, *Neutron activation analysis, Air pollution, Closed ecological systems, Concentration (composition), Earth resources, Rivers, Sludge, Water pollution.

For abstract, see STAR 10 21.

6G. Escape, Rescue, and Survival

AD-750 463 PC$3.00/MF$0.95
Honeywell Inc Minneapolis Minn Systems and Research Div
AN INVESTIGATION OF AIRBORNE DISPLAYS AND CONTROLS FOR SEARCH AND RESCUE (SAR). VOLUME IV. AVIONICS REQUIREMENTS FOR A UTILITY AIRCRAFT.
Final rept. Sep 71-Jan 72,
O. H. Lindquist, B. A. Olson, R. J. Kirk, and J. W. Wingert. Sep 72, 77p Rept no. 12609-FRI-Vol-4 JANAIR-720901
Contract N00014-69-C-0460
See also Volume 3, AD-728 043.

Descriptors: (*Rescues, Utility planes), (*Utility planes, Electronic equipment), (*Display systems, Utility planes), (*Water pollution, Sensors), Coast guard, Aircraft equipment, Monitors, Man-machine systems, Search radar, Television equipment, Low-intensity illumination, Infrared detectors, Panoramic cameras, Systems engineering, Costs.
Identifiers: *Search and rescue, Avionics, Water pollution detection.

An analytical study was conducted to define an avionics system concept for a U.S. Coast Guard multimission fixed-wing twin-engine aircraft. The system requirements were compiled from a previous concept definition study done under this contract for a search and rescue helicopter and from analysis of mission scenarios fitted to the unique USCG missions. The study tasks included development of representative mission scenarios, avionics and sensor package selection, man/machine function allocation, workload analysis and simulation, aircraft ride qualities and crew visibility analyses, and definition of a recommended cockpit configuration and sensor installation. (Author)

6H. Food

AD-750 368 PC$3.00/MF$0.95
Army Natick Labs Mass
INCREASED DENSITY FOR MILITARY FOODS,
Abdul R. Rahman, Walter L. Henning, Sheldon Bishov, and Donald E. Westcott. 1972, 15p

Descriptors: (*Food, Freeze drying), Density, Weight, Volume, Quality control, Nutrition, Storage, Pressure, Drying, Moisture, Processing, Vegetables, Test methods, Acceptability, Military requirements.
Identifiers: Food compression, Texture.

The objective of these studies was the reduction of food weight and volume while maintaining overall quality, nutritional value, stability and acceptability. Three research and development approaches were pursued: Reversible compression of foods for consumption only in a reconstituted state; Nonreversible compression of foods for consumption only in the compressed state; and, Dual purpose compression of foods for consumption either in the more dense form or after reconstitution to a familiar form.

AD-750 521 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THERMAL CONDUCTIVITY OF NORMAL BEET JUICE,
M. Z. Khelemskii, and V. Z. Zhadan. 4 Aug 72, 8p Rept no. FTD-HT-23-14-72
Edited trans. of Vsesoyuznyi Nauchno-Issledovatelskii Institut Sakharnoi Promyshlennosti. Trudy (USSR) n10 p11-13 1964, by Rene E. Courville.

Descriptors: (*Vegetables, *Thermal properties), Sucrose, Thermal conductivity, Calorimeters, Liquids, Temperature, USSR.
Identifiers: Translations, Sugar beets.

A bicalorimeter was used for thermal conductivity measurements. It consists of 2 spheres, one within the other, the space between being filled with the test solution which is heated to a required temperature and cooled in H2O. The thermal conductivity is calculated from the cooling rate. For press juice of >80 purity, it was almost identical with that of a refined sugar solution of the same purity. (Author)

COM-72-11333 PC$3.00/MF$0.95
Mississippi Marine Conservation Commission, Biloxi.
A STUDY OF THE BACTERIAL SPOILAGE PATTERNS IN ICED 'PENAEUS' SHRIMP.
Completion rept. Aug 67-Jun 70,
David W. Cook. Oct 70, 56p NOAA-72091995
Grant NMFS-2-61-R
Prepared in cooperation with Gulf Coast Research Lab., Ocean Springs, Miss.

Descriptors: (*Seafood, *Bacteriology), (*Food deterioration, *Shrimps), Food storage, Ice refrigeration, Bactericides, Sodium sulfites, Pseudomonas, EDTA.
Identifiers: Penaeus, *Bacterial spoilage prevention, Sodium bisulfite.

A study of the numbers and types of bacteria developing on ice stored shrimp has been conducted. Pseudomonas species were studied as the predominant bacterial type present on shrimp at the onset of spoilage, comprising greater than 95% of the population present on spoiled shrimp. Studies were conducted using salts of ethylenediaminetetra acetic acid (Na4EDTA) was found to inhibit the growth of Pseudomonas bacteria isolated from spoiling shrimp. When the Na4EDTA treatment was used in combination with a sodium bisulfite dip, the organoleptic quality of the shrimp was greatly improved.

COM-72-11345 PC$3.00/MF$0.95
Oregon Fish Commission, Portland.
PREPARATION OF FISH PROTEIN CONCENTRATE FROM HAKE.
Completion rept. Jul 70-Jun 71,
David L. Crawford. Aug 71, 34p NOAA-72092003
Grant NMFS-1-64-R
Prepared in cooperation with Oregon State Univ., Corvallis.

Descriptors: (*Fish protein concentrates, Dewatering), Lipids, Taste, Odor, Flavor, Colloiding, Quality, Solvent extraction.
Identifiers: Hake, Drum drying process.

Investigations evaluating drum drying as a means of removing water in preparing fish protein concentrate indicated that lipid levels in the whole fish have a significant influence on the taste, odor, color and quality of the final product. Extraction of lipids with organic solvents, was more difficult from drum dried meal than wet whole fish that had been lyophilized to remove water. Fine milling of whole fish reduced deleterious reactions during the drum drying process. Lipid extraction was enhanced by fine milling of the dried meal. (Author)

COM-72-11387 Reprint
National Maine Fisheries Service, Gloucester, Mass. Atlantic Fishery Products Center.
SOME CHEMICAL CHANGES IN IRRADIATED SEAFOODS,
Frederick J. King, Joseph M. Mendelsohn, Donald F. Gadbois, and Julius B. Bernsteinas. 1972, 18p NOAA-72091626
Sponsored in part by Atomic Energy Commission, Washington, D.C.
Pub. in Radiation Research Reviews, v3 p399-415 1972.

Descriptors: (*Irradiated foods, Radiation chemistry), (*Seafood, Irradiated foods), Preservation, Lipids, Irradiation, Food additives, Food processing.

The current state of knowledge in the radiation chemistry of seafoods is described. Consideration is given to volatile compounds, free amino acids, fatty acids, components of a water-methanol extract and nutrients. It is concluded that preservation of seafoods by radiation treatment can produce changes in their composition that are of the same order of magnitude as those from traditional preservation methods. Although radiation is really a processing method, it is considered as a food additive in the Federal Food, Drug, and Cosmetic Act.

COM-72-11390 Reprint
National Marine Fisheries Service, College Park, Md.
COLLABORATIVE STUDY OF THE DETERMINATION OF TOTAL LIPIDS IN FISH MEAL.
George M. Knobl, Jr., and Harry Miller, Jr. 1972, 4p NOAA-72091624
Presented at Annual Meeting of the Association of Official Analytical Chemists (85th) Washington, D.C., 11-14 Oct 71.
Pub. in Jnl. of the Association of Official Analytical Chemists, v55 p654-656 May 72.

Descriptors: (*Fish protein concentrates, *Lipids), Chemical analysis, Extraction, Extractors.

A semimicro methof for determining total lipids in fish meal, using a compact extraction apparatus, was subjected to collaborative study. Four fish meals were analyzed for total lipids by 8 collaborators. Per cent lipid content of meals prepared from Canadian herring, Peruvian anchovetta, Atlantic menhaden I, and Atlantic menhaden II were 14.69 plus or minus 0.37, 15.98 plus or minus 0.28, 14.66 plus or minus 0.45, and 10.86 plus or minus 0.26, respectively. In our laboratory, the new extraction technique was also compared with a blender technique. In general, the variation in lipid content within a laboratory, using the extractor, was less than the variation found in our laboratory, using theblender. The semi-micro method for the determination of total lipids in fish meal has been adopted as official first action. It is recommended that another collaborative study be conducted, using both the blender and the extractor. (Author)

6I. Hygiene and Sanitation

N72-28034 PC$13.00/MF$0.95
Midwest Research Inst., Kansas City, Mo.
CLEAN ROOM TECHNOLOGY IN SURGERY SUITES.
22 May 71, 218p NASA-CR-127442
Contracts NASW-1936, MRI PROJ. 3332-E (D)
Conf- Conf. Held At John F. Kennedy Space Center, Fla., 21-22 May 1971

Descriptors: *Clean rooms, *Conferences, *Surgery, Laminar flow, Microorganisms, Operations, Sterilization, Technology utilization.

For abstract, see STAR 10 19.

N72-28035 PC$3.75/MF$0.95
Martin Marietta Corp., Denver, Colo.

EXPERIMENTAL SYSTEM FOR THE CONTROL OF SURGICALLY INDUCED INFECTIONS.
Operating and Maintenance Instructions
May 72, 33p NASA-CR-127641,
MCR-71-326-ISSUE-2-REV
Contract NASW-2210
Misc 0revised

Descriptors: *Clean rooms, *Infectious diseases, *Surgery, Air filters, Portable equipment, Protective clothing, Telecommunication, Vacuum apparatus.

For abstract, see STAR 10 19.

N72-28036 PC$6.75/MF$0.95
Martin Marietta Corp., Denver, Colo.
EXPERIMENTAL SYSTEM, AND ITS EVALUATION FOR THE CONTROL OF SURGICALLY INDUCTED INFECTIONS.
Final Report
M. D. Tevebaugh, and J. P. Nelson. May 72, 93p
NASA-CR-127449, MCR-72-80
Contract NASW-2210

Descriptors: *Clean rooms, *Infectious diseases, *Sterilization, Bacteria, Contamination, Laminar flow.

For abstract, see STAR 10 19.

N72-28095 PC$3.25/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
ZERO-GRAVITY OPEN-TYPE URINE RECEPTACLE.
A. S. Girala. Feb 72, 24p NASA-TM-X-58085, MSC-05813
Conf- Presented At Conf. on Body Waste Systems for Spacecraft, Hampton, Va., 17 May 1971

Descriptors: *Apollo spacecraft, *Command modules, *Urination, *Weightlessness, Human factors engineering, Urine.

For abstract, see STAR 10 19.

PAT-APPL-266930 PC$3.00/MF$0.95
Mcdonnell-douglas Co., St. Louis, Mo.
A POTABLE WATER DISPENSER.
Patent Application
H. R. Cunningham. Filed 28 Jun 72, 27p
NASA-CASE-MFS-21115-1
Subm- Sponsored By Nasa
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Dispensers, *Potable water, *Water management, Dehydrated food, Patent applications, Space flight feeding.

A mechanism for dispensing precisely measured charges of potable water into reconstitution bags is described. The dispenser includes a tubular body with an axially reciprocable piston. The piston is spring-biased toward an end wall forming a chamber intake port, and ejection port. The volume of the chamber is controlled by the position of the head of the piston. The extent to which the piston is displaced for expanding the chamber is controlled by the position of the shaft. Delivery of potable water to and from the chamber is controlled by a rotary valve, while final dispensing of water is controlled by a linear valve which operates in relation to the rotary valve.

6K. Life Support

PAT-APPL-266925 PC$3.00/MF$0.95
Mcdonnell-douglas Co., St. Louis, Mo.
A FLUID DISPENSER.
Patent Application
T. A. Cook, and H. Scheibe. Filed 28 Jun 72, 22p
NASA-CASE-MFS-21163-1
Subm- Sponsored By Nasa
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Onboard equipment, *Portable equipment, *Potable water, *Space flight feeding, Aerospace engineering, Dispensers, Patent applications.

A cyclically operable fluid dispenser particularly suited for use in dispensing precisely measured charges of potable water aboard spacecraft is disclosed. The dispenser is characterized by a sealed housing adapted to be held within a crewman's palm and coupled with a pressurized source of potable water, a dispensing jet projected from the housing and configured to be received within a crewman's lips, an expansible measuring chamber for measuring charges of drinking water received from the source, and a dispenser actuator including a lever extended from the housing to be digitated for initiating operational cycles.

N72-28101 PC$6.00/MF$0.95
Advanced Rocket Technology, Irvine, Calif.
EVALUATION OF ADVANCED COMPONENT CONCEPTS FOR AN INTEGRATED ENVIRONMENTAL CONTROL/LIFE SUPPORT, RESISTOJET CONTROL SYSTEM.
C. R. Halbach, P. D. Arthur, and R. J. Page. Jun 72, 78p NASA-CR-112104
Contract NAS1-10767

Descriptors: *Environmental control, *Flow regulators, *Heat pumps, *Life support systems, *Resistojet engines, Control equipment, Performance tests, Reliability engineering.

For abstract, see STAR 10 19.

N72-28108 PC$7.25/MF$0.95
Chemtric, Inc., Rosemont, Ill.
POTABLE WATER BACTERICIDE AGENT DEVELOPMENT.
Final Report, Jun. - Dec. 1971
T. L. Hurley, and R. A. Bambenek. Jul 72, 104p
NASA-CR-115595, REPT-3097
Contract NAS9-12104

Descriptors: *Bactericides, *Potable water, *Space shuttles, *Water treatment, Life support systems, Silver chlorides.

For abstract, see STAR 10 19.

N72-28145 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AN ETIOLOGICAL STUDY OF PHTHALATE SELF-CONTAMINATION OF SPACECRAFT AND CONTAMINATION FROM THEIR EARTHLY ENVIRONS.
F. C. Gross, and J. A. Colony. Aug 72, 19p
NASA-TN-D-6903, G-1070

Descriptors: *Phthalates, *Spacecraft contamination, *Volatility, Etiology, Gas chromatography, Mass spectroscopy, Plasticizers, Thin films, Ultraviolet spectra.

For abstract, see STAR 10 19.

N72-29082 PC$19.00/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
APOLLO 13 LIOH CANISTER BREAKTHROUGH TEST.
J. C. Leblanc. 15 Jul 70, 338p NASA-TM-X-68571, MSC-01343
Contract PROJ. APOLLO

Descriptors: *Apollo 13 flight, *Emergency life sustaining systems, *Environmental control, Carbon dioxide, Lithium hydroxides, Respiration, Simulation.

For abstract, see STAR 10 20.

N72-29083 PC$6.50/MF$0.95
Westinghouse Electric Corp., Pittsburgh, Pa.
CONCEPTUAL DESIGN STUDY OF A SIX-MAN SOLID ELECTROLYTE SYSTEM FOR OXYGEN RECLAMATION.
J. P. Morris, C. K. Wu, L. Elikan, N. J. Bifano, and R. R. Holman. 1972, 89p NASA-CR-112063
Contract NAS1-8896

Descriptors: *Carbon dioxide, *Electrolysis, *Manned space flight, *Oxygen production, *Water vapor, Closed ecological systems, Hydrogen, Mechanical properties, Palladium.

For abstract, see STAR 10 20.

N72-29092 PC$4.00/MF$0.95
Royal Aircraft Establishment, Farnborough (England).
A LABORATORY COMPARISON OF THREE METHODS OF PERSONAL CONDITIONING.
J. R. Allan, M. F. Allnutt, M. A. Beeny, R. D. Hanson, and J. Morrison. 1972, 39p ARC-CP-1210, RAE-TR-70212
Misc 0supersedes Rae-tr-70212 Seen71-30127 Arc-32961

Descriptors: *Cooling systems, *Environment simulation, *Flight crews, *Protective clothing, *Thermal comfort, Air cooling, Aircraft performance, Liquid cooling, Physiological responses, Psychological effects, Suits.

For abstract, see STAR 10 20.

N72-29825 PC$31.25/MF$0.95
Matrix Man Systems, Huntsville, Ala.
EXTRAVEHICULAR ACTITIVIES GUIDELINES.
N. E. Brown, T. R. Dashner, and B. C. Hayes. 31 Mar 72, 581p NASA-CR-123751
Contract NAS8-27502

Descriptors: *Bioastronautics, *Extravehicular activity, *Human performance, *Orbital workers, *Support systems, Aerospace environments, Bibliographies, Mission planning, Orbital space stations, Physiological effects, Pressure suits.

For abstract, see STAR 10 20.

N72-30113 PC$4.75/MF$0.95
Research Triangle Inst., Durham, N.C.
PRELIMINARY DESIGN STUDY OF A REGENERATIVE LIFE SUPPORT SYSTEM INFORMATION MANAGEMENT AND DISPLAY SYSTEM.
Final Report
C. D. Parker, and J. B. Tommerdahl. Apr 72, 51p
NASA-CR-112105
Contract NAS1-11077

Descriptors: *Display devices, *Information systems, *Life support systems, *Malfunctions, Parameterization, Safety management, Warning systems.

For abstract, see STAR 10 21.

N72-30114 PC$6.00/MF$0.95
Vought Missiles and Space Co., Dallas, Tex.
ADVANCED EXTRAVEHICULAR PROTECTIVE SYSTEMS (AEPS) STUDY.
Interim Report, Jul. 1970 - May 1971
J. L. Williams, R. J. Copeland, and B. W. Webbon. May 71, 77p NASA-CR-114321
Contract NAS2-6022

Descriptors: *Extravehicular activity, *Life support systems, *Systems engineering, Bibliographies, Lunar topography, Mars surface, Regeneration (engineering).

For abstract, see STAR 10 21.

N72-30128 PC$3.25/MF$0.95
Southwest Research Inst., San Antonio, Tex.
A STUDY OF VOLATILE CONTAMINANTS IN RECOVERED WATER.
H. C. Mckee, and R. Marek, Jr. May 72, 23p
NASA-CR-115755, TR-1
Contract NAS9-11580

Descriptors: *Distillation, *Organic materials, *Urine, *Volatility, *Water reclamation, Spacecraft environments, Systems engineering, Trace contaminants.

For abstract, see STAR 10 21.

6L. Medical and Hospital Equipment

AD-750 308 PC$3.00/MF$0.95
Walter Reed Army Medical Center Washington D C Army Inst of Dental Research
ROLE OF WATER JET DEVICES IN COMBAT SURGERY,
Surindar N. Bhaskar, Arthur Cross, and Duane E. Cutright. 1972, 15p

Descriptors: (*Surgical instruments, *Liquid jets), (*Wounds + injuries, Surgical techniques), Surgical instruments, Battle injuries, Efficiency.
Identifiers: *Debridement, Field hospitals.

A series of studies were conducted at the United States Army Institute of Dental Research for the purpose of developing an efficient method for the debridement of combat wounds. These experiments led to the fabrication and utilization of a new multi-jet pulsating device which is currently used for effective and rapid debridement of combat and noncombat wounds.

N72-28086 PC$3.00
Beckman Instruments, Inc., Fullerton, Calif. Advanced Technology Operations.
WHITE BLOOD CELL COUNTING SYSTEM.
Final Report
15 Jul 72, 19p NASA-CR-115706, FR-1089-101
Contract NAS9-12371

Descriptors: *Counters, *Medical equipment, *Skylab program, *Systems engineering, *White blood cells, Prototypes, System effectiveness, Test equipment.

For abstract, see STAR 10 19.

PB-212 695 PC$3.00/MF$0.95
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
DEVELOPMENT AND EVALUATION OF ARTIFICIAL DENTAL ANCHORS OF NON-NATURAL DESIGN IMPLANTED IN MINIATURE SWINE.
Annual rept. 30 Jun 71-29 Jun 72,
R. P. Marshall, M. T. Karagianes, J. J. Rasmussen, and R. E. Westerman. Aug 72, 43p NIDR-NIH-71-2386-1
Contract PHS-72-2386

Descriptors: (*Dental prostheses, Implantation), Dental materials, Ceramics, Titanium alloys, Fabrication, Evaluation, Swine, Bioassay.
Identifiers: *Biocompatible materials.

Four porous materials, two ceramic and two forms of titanium alloy, have been fabricated into dental anchors and pins and implanted into the mandibles of miniature swine. The metal anchors, all Ti-6Al-4V alloy, have been fabricated from both Battelle-developed Void Metal Composite and gravity-sintered spherical particles. The ceramic materials, alumina porcelain and magnesium aluminate spinel, were formed into anchors of varying porosity by special slip casting and firing techniques. Two basic anchor designs, oblong and cylindrical, have been used in these studies. Oblong anchors and early dental pins suffered a high in vivo failure rate, due to post-operative infection and rejection, resulting from design, implant fit, and operative technique. Newer cylindrical anchors and test pins are demonstrating encouraging results, with complete acceptance by the surrounding soft tissues and bony ingrowth into the porous prostheses.

PB-212 724 PC$3.00/MF$0.95
Polysciences, Inc., Warrington, Pa.
POLYMER STUDIES RELATED TO PROSTHETIC CARDIAC MATERIAL WHICH ARE NON-CLOTTING AT A BLOOD INTERFACE.
Annual rept. Jan-Dec 71,
B. David Halpern, Paul J. McGonigal, and Heinz W. Blessing. 29 Sep 72, 25p PH-43-66-1124-5
Contract PH-43-66-1124
See also report dated 22 Jan 71, PB-200 987.

Descriptors: (*Mechanical hearts, *Plastic coatings), (*Blood coagulation, Plastic coatings), (*Polyacrylamides, Mechanical hearts), Plastic coatings, Gels, Prosthetic devices, Graft polymerization, Acrylic resins, Tensile strength, Purification.
Identifiers: *Blood compatible materials, *Cardiac assist devices, Methacrylic acid/hydroxymethylester).

Grafting conditions were devised to give thin, uniform acrylamide hydrogel grafts onton polyurethane substrates by ceric (IV) ion initiation. Using this technique, intra-aortic assist balloons, vena cava rings, assist tubes and bladders were successfully grafted and submitted for in vivo testing. Grafting conditions were dictated by the nature of the polyurethane substrate. Methods for the purification of acrylamide on a large scale and for purity monitoring were developed. Purification of 2-hydroxyethyl methacrylate was explored. Graft thickness and hydration of grafts was measured by microscopic techniques. Water uptake by the dried graft was reversible. Tensile strength testing of hydrogel-grafted polyurethane film was initiated. (Author)

6M. Microbiology

AD-750 327 PC$3.00/MF$0.95
Walter Reed Army Inst of Research Washington D C
RESTORATION OF DRUG-RESISTANT BACTERIA TO SENSITIVITY TO CHEMOTHERAPEUTIC DRUGS,
Fred E. Hahn, and Jennie Ciak. 1972, 15p

Descriptors: (*Bacteria, *Chemotherapeutic agents), Drugs, Sensitivity, Tolerances (Physiology), Genetics, Antibiotics, Escherichia coli, Klebsiella pneumoniae, Salmonella typhosa.
Identifiers: *Drug tolerance, Episomes.

Bacterial diseases caused by drug-resistant organisms present major problems in military medicine. Clinical (foremost quinacrine) as well as experimental pharmaceuticals and dyes restored drug-resistant bacteria to sensitivity to chemotherapeutic drugs when this resistance was caused by episomal R-factors. This was first shown in model experiments with Escherichia coli and subsequently with pathogenic Klebsiella pneumoniae and, especially, with Salmonella typhimurium. Maximally, more than 95 per cent of cells of S. typhimurium regained sensitivity to the antibiotic drug, kanamycin, when grown in the presence of ethidium bromide. The mechanism underlying the elimination of resistance determinants is the formation of complexes of active with R-factor DNA followed by selective inhibition of its replication. The fate of the episomal F'lac DNA upon elimination of the lac determinant with quinacrine was studied biophysically. Since R-factor DNA is closed circular in its molecular architecutre, the eliminating compounds act not only by stabilizing double-helical DNA to strand separation but also wind up the DNA circles into artificial supercoils whose biochemical functionality is suspended.

AD-750 376 PC$3.00/MF$0.95
Deseret Test Center Dugway Proving Ground Utah Chemical Div
PROBLEMS IN THE ARBOVIROLOGY OF THE BONNEVILLE BASIN, UTAH,
Keith L. Smart. 1972, 15p

Descriptors: (*Arboviruses, Serodiagnosis), (*Venezuelan equine encephalomyelitis virus, Serodiagnosis), Utah, Ecology, Epidemiology, Antigens + antibodies, Disease vectors, Culicidae, Mammals, Rodents, Experimental data.

Pertinent to the results of a serological survey in 1961 of West Central Utah in which there appeared both complement fixing (CF) and serum neutralizing (N) antibodies against three arboviruses, an arboviral survey was initiated by the Army Ecology and Epidemiology Group at Dugway. Since the observations were made in and adjacent to the Proving Ground at Dugway, Utah, it became the purpose of these studies to inquire into the stability or the transiency of these antibodies to the area, particularly those of the VE virus, known to be of tropical ecology. The following investigations were pursued: (1) Experimental clarification of sero-diagnostic titer relationships in native mammals, (2) Comparative VE virus infection studies in native rodents and (3) Experimental viral interference studies in suckling mice as pertains to the sensitivity and specificity of diagnostic tests.

AD-750 385 PC$3.00/MF$0.95
Walter Reed Army Inst of Research Washington D C
PENETRATION OF THE INTESTINAL EPITHELIUM BY VARIOUS MICROORGANISMS,
Akio Takeuchi. 1972, 15p

Descriptors: (*Microorganisms, Intestines), (*Intestines, *Infections), (*Enterobacteriaceae, Pathology), Tissues (Biology), Penetration, Bacteria, Histology, Electron microscopy, Gastrointestinal system, Salmonella, Shigella dysenteriae, Vibrio, Cholera, Protozoa.
Identifiers: Cryptosporidium wrairii.

Enteric microbes may be classified into four groups in accordance with their invasive potential into the host. The first group is characterized by a pathogen which readily invades through the epithelial barrier, multiples in the mucosa and leads to a systemic invasion. Salmonella organisms belong to this group. The second group is represented by shigella dysentery. Shigella organisms characteristically produce far more severe epithelial changes than salmonellae. Members of the third group preferentially reside in the brush border and may or may not produce an overt acute inflammatory response and structural alterations of the gut mucosa. This group includes Cryptosporidium wrairii, and intestinal spirochetes attaches to the gut epithelium but causes severe symptoms thru absorption of their moiety. This group is exemplified by cholera vibrio. The report summarizes observations on the host-microbe interaction at the epithelial barrier in the first three types of enteric infections.

AD-750 448 Reprint
Naval Medical Research Inst Bethesda Md
METABOLISM OF 'RICKETTSIA TYPHI' AND RICKETTSIA AKARI' IN IRRADIATED L CELLS.
Medical research progress rept. no. 30,
Emilio Weiss, Lawrence Newman, Richard Grays, and Ann Grenn. 14 Mar 72, 10p
Availability: Pub. in Infection and Immunity, v6 n1 p50-57 Jul 72.

Descriptors: (*Rickettsia typhi, Metabolism), (*Rickettsia akari, Metabolism), Growth, Tissue culture cells, Radiobiology, Desoxyribonucleic acids, Biosynthesis, Proteins, Nucleic acids, Thymidines.
Identifiers: Cycloheximide.

L cells that had been exposed to 3,000 r of 60Co the previous day were used to study the growth and metabolism of Rickettsia typhi and R. akari. Viable (unirradiated) L cells were used to study the effect of rickettsial infection of host-cell metabolism. At various intervals, cycloheximide was added to one set of cultures, to inhibit eukaryotic protein and deoxyribonucleic acid (DNA) metabolism; phosphate-buffered saline (PBS) was added to another set. Infectivity of R. typhi increased to a peak of 150 to 400 hemolytic units/culture on day 4. Cycloheximide-resistant activity was higher in the infected cultures, with a peak equivalent to one-half the total activity at day 4 to 5. Total as well as cycloheximide-resistant adenine incorporation was higher in the infected cells between days 3 and 5 after infection, with a peak at day 3 to 4. Somewhat similar results were obtained with R. akari, except that the cycle of infection and of cycloheximide-resistant activity proceeded and was completed more rapidly. With labeled thymidine, it was shown that R. typhi and R. akari differ considerably in their effects on the host cell. R. typhi elicited moderate inhibition, whereas R. akari infection led to a complete inhibition of thymidine. It is concluded that rickettsiae have the necessary enzymes for protein and nucleic acid synthesis, but, thus far, these enzymes have been activated or induced only in an intracellular environment. (Author)

AD-750 454 Reprint
Naval Medical Research Inst Bethesda Md
EFFECT OF HYPERBARIC ATMOSPHERES ON BETA-GALACTOSIDE TRANSPORT IN 'ESCHERICHIA COLI'.
Medical research progress rept. no. 3,
Norbert A. Schlamm, and O. P. Dailey. 12 Apr 72, 6p
Revision of report dated 21 Dec 71.
Availability: Pub. in Canadian Jnl. of Microbiology, v18 n7 p1162-1164 1972.

Descriptors: (*Escherichia coli, High-pressure research), (*Carbohydrates, Escherichia coli), Pressure, Bacteria, Transport properties, Absorption (Biological).
Identifiers: *Hyperbaric atmospheres, *Galactosides.

The rates of transport of two beta-galactosides by whole cells of Escherichia coli were elevated by pressurization to 68 atm with helium or helium-oxygen gases. Kinetic analyses showed that the high atmospheric pressure caused an increase in V max values of some 20 to 48% whereas K sub m values were unchanged. (Author)

AD-750 457 Reprint
Naval Medical Research Inst Bethesda Md
'PSEUDOMONAS AERUGINOSA' EXOTOXIN: EFFECT ON CELLULAR AND MITOCHONDRIAL RESPIRATION.
Medical research progress rept. no. 2,
Olgerts R. Pavlovskis. 13 Mar 72, 8p
Availability: Pub. in The Jnl. of Infectious Diseases, v126 n1 p48-53 Jul 72.

Descriptors: (*Pseudomonas aeroginosa, *Toxins + antitoxins), Mitochondria, Cells (Biology), Respiration, Membranes (Biology), Oxygen consumption, Kidneys, Liver, Bacteria, Infections.
Identifiers: *Exotoxins.

Two approaches were used to study the effect of a lethal, heat-labile exotoxin isolated from PSEUDOMONAS AERUGINOSA. First, mitochondria and whole cells from livers of mice were exposed in vitro to relatively large doses of the exotoxin. Under these conditions, a section of the electron-transport system either or at prior to the cytochrome-c site was damaged. In vitro, the exotoxin induced mitochondrial swelling, which suggested changes in membrane permeability. Second, respiration of hepatic and renal cells and of hepatic mitochondria taken from mice just before death from the toxin was measured in vitro. An increase in uptake of oxygen was seen with the hepatic cells and mitochondria, indicating uncoupling of oxidative phosphorylation. Renal cells showed a decrease in consumption of oxygen. (Author)

AD-750 635 PC$3.00/MF$0.95
Beth Israel Medical Center New York Dept of Labs
NUTRIENT (LIPID, NUCLEOSIDE, AND SOLUBLE METABOLITE) STUDIES ON INTRAERYTHROCYTIC MALARIA PARASITES.
Rept. no. 2 (Final), 1 Mar 71-31 May 72,
Jack D. Tiner. Aug 72, 30p
Contract DADA17-70-C-0117

Descriptors: (*Plasmodium, Erythrocytes), In vitro analysis, Biochemistry, Physiology, Blood plasma, Lipids, Nucleosides, Parasites, Growth.
Identifiers: *Malaria.

The sum of various efforts to culture malaria during more than half a century suggests that achievement of sustained in vitro cultivation requires a confluence of expertise from the basic disciplines that underlie the field of parasitology. The present study is concerned with advances in intracellular cultivation along lines where further progress appears to be feasible. More than one generation of malaria can be raised in red cells. There is considerable information available regarding physiology of blood cells and biochemistry of the plasma in which they are suspended. The essential and novel item of the new system is a rotary connector. This links six lines that transmit liquids and gases to and from culture chambers spinning in a centrifuge. Preliminary tests of the first model indicated that the design selected is feasible. A revision needed for initiation of cultivation studies was under construction at the end of the report period. (Author)

AD-750 729 PC$3.00/MF$0.95
Missouri Univ Columbia Space Sciences Research Center
IN VIVO EFFECT OF LOW INTENSITY DIRECT CURRENT ON VIABILITY OF PSEUDOMONAS AERUGINOSA INFECTION.
Annual summary rept.,
Blair A. Rowley, John M. McKenna, Lester E. Wolcott, and Gerald R. Chase. Oct 72, 24p Rept no. DOD-1972-2006-1
Contract DADA17-72-C-2006

Descriptors: (*Pseudomonas aeroginosa, Electric currents), Wounds + Injuries, Healing, Infections, In vivo analysis, Bacteria.

The effect of low intensity direct current on infected wounds is reported along with preliminary work on effects on wound healing. A complete description of the procedures and results are given. The results show that electrical currents had a deleterious effect on the infecting microorganism. (Author)

AD-750 780 PC$3.00/MF$0.95
Science Spectrum Inc Santa Barbara Calif
THE DIELECTRIC STRUCTURE, FREE WATER CONTENT, AND DIPICOLINIC ACID DISTRIBUTION WITHIN VIABLE BACTERIAL SPORES.
Final rept.,
Philip J. Wyatt. Oct 72, 85p Rept no. SSI-722
Contract DAHC19-70-C-0031

Descriptors: (*Dielectric properties, Spores), (*Spores, *Refractive index), (*Bacteria, Spores), Biochemistry, Biophysics, Water, Bacillus, Clostridium, Light transmission, Morphology (Biology), Electron microscopy.
Identifiers: Pyridine dicarboxylic acid/2-6, Bacillus sphaericus, Clostridium filamentosum.

The differential light scattering characteristics of single spores from Bacillus sphaericus and Clostridium filamentosum were measured and recorded for several hundred different spores using an argon-ion laser source (lambda = 514.5 nm) and a special single particle light scattering photometer. Typical recorded light scattering patterns were interpreted analytically by adjusting the parameters of a spherically symmetric model to the data using a least squares fitting procedure. For both species, the average refractive index of the spore cortex was 1.54 plus or minus 0.01, while the average cost refractive index was only 1.47 plus or minus 0.01. The size fluctuations of the cortices were very small and suggest that the cortex structure may well be identical for different spores of the same species. The free water content of spores was found to be negligible since measurements of individual spores suspended in a dry environment for 24 hours showed no changes in time. Spores for which dipicolinic acid had been removed could not be used to obtain satisfactory light scattering patterns for subsequent analyses. A hypothesis is presented that DPA acts as a filler material in the cortex to prevent free water penetration. (Author)

AD-750 821 Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
EXPERIMENTAL CHOLERA PRODUCED BY CHOLERAGENIC FILTRATES: LOCALIZATION OF TOXINS BY FLUORESCENT ANTIBODY TECHNIQUES.
Technical rept.,
B. T. Schaeffer, S. C. Sun, and R. I. Walker. 25 May 71, 13p Rept no. NAMRU-2-TR-511
Availability: Pub. in Chinese Jnl. of Microbiology, v5 n1,2 p27-35 Jun 72.

Descriptors: (*Cholera, Toxins + Antitoxins), Bacteria, Infectious diseases, Absorption (Biological), Fluorescent antibody techniques, Tissues (Biology), Pathology, Histology, Heart, Liver, Lungs, Experimental data, Rabbits.
Identifiers: *Vibrio cholerae.

Experimental cholera was induced by feeding filtrates of V. Cholerae broth culture to suckling rabbits through gastric tubes. The dissemination of cholera metabolites containing both exotoxin and endotoxin was then traced by fluorescent antibody techniques at different time intervals after administration. A pattern of distribution of the toxins indicating various phases and rates of absorption through intestinal mucosa was demonstrated. The bacterial toxins passed through the brush border of intestinal villi and into the cells of the lining epithelium. Later these substances were detected in deeper portions of the mucosa and submucosa and in the walls of small blood vessels. They penetrated the vessel wall barriers achieving systematic distribution. Fluorescence appeared predominantly in the kidney and lung but lesser amounts were found in the heart, liver, and spleen. Fluorescence in the kidney was first demonstrated in the tubular lumens and was later seen absorbed onto the tubular epithelial cells. The presence of fluorescent complexes in heart, liver and lung tissue correlates with histologic findings of focal myocarditis, hepatic parenchymal degeneration, and pneumonitis. (Author)

AD-750 836 Reprint
Naval Medical Research Inst Bethesda Md
RESPONSE OF MICE TO INJECTION OF RIBOSOMAL FRACTION FROM GROUP B 'NEISSERIA MENINGITIDIS'.
Medical research progress rept. no. 13,
David W. Thomas, and Emilio Weiss. 28 Mar 72, 11p
Availability: Pub. in Infection and Immunity, v6 n3 p355-363 Sep 72.

Descriptors: (*Neisseria meningitidis, *Ribosomes), (*Vaccines, Neisseria meningitidis), Antigens + antibodies, Immunity, Mice, Experimental data.

Ribosomes of strain NOR-7 of group B Neisseria meningitidis were isolated by a procedure that included treatment of the cells with sodium dodecyl sulfate, disruption in a French pressure cell, and differential centrifugation. The preparations consisted of 66% ribonucleic acid and 24% protein and sedimented as a single componenent with a constant of approximately 66S. When injected into mice, group B ribosomes elicited an increase in the number of antibody-prodcing spleen cells demonstrable by the hemolytic plaque technique using unsensitized sheep erythrocytes. Sensitization of the erythrocytes with increasing amounts of supernatant fluid of meningococcal cultures progressively reduced the number of demonstrable plaque-forming cells. Neuraminidase treatment of the erythrocytes increased immune hemolysis, whereas Pronase digestion reduced it. Injected mice were protected against homologous and heterologous meningococcal challenge. Both hemolysis and protection-inducing activities of the robosomes were unimparied by ribonuclease, but were reduced by Pronase. It is consluded that the immunological response elicited by the meningococcal ribosomes does not involved the group-specific carbohydrate antig n. The immunological mechanisms by which the mice are protected against meningococcal challenge remains unknown. (Author)

AD-750 837 Reprint
Naval Medical Research Inst Bethesda Md
CO2 PARTIAL PRESSURE AND THE ENTHALPY AND THERMODYNAMIC EFFICIENCY OF THE OXIDATION OF NITRITE BY NITROBACTER.
Medical research progress rept. no. 2,
L. A. Kiesow, J. B. Shelton, and J. W. Bless. 12 May 72, 8p
Revision of report dated 13 Mar 72.
Availability: Pub. in Archives of Biochemistry and Biophysics, v151 n2 p414-419 Aug 72.

Descriptors: (*Nitrites, Oxidation), (*Pseudomonadaceae, Nitrites), (*Carbon dioxide, Pseudomonadaceae), Pressure, Heat of reaction, Enthalpy, Thermodynamics, Metabolism, Physiology, Bacteria, Biophysics.
Identifiers: Nitrobacter.

The heat of reaction of the oxidation of nitrate by NITROBACTER was determined at different partial pressures of CO2. Its value decreases from the theoretical value of -24.6 kcal x 1/mole to -18.5 kcal.1/mole, and levels at this value, as pCO2 is increased from 0 to 10 vol % CO2 at atmospheric pressure. The cell-free fixation of CO2 depends on pCO2 in an identical manner and is the mechanism responsible for the observed decrease in the apparent enthalpy. The overall thermodynamic efficiency of the nitrite oxidation can be calculated from two determinations of heats of reaction. The value is 34%. (Author)

AD-750 971 Reprint
Kurume Univ (Japan) Dept of Microbiology
A LARGE AND SMALL PLAQUE VARIANT OF SINDBIS VIRUS CHICK EMBRYO CELLS (36564),
Masahiro Nakamura, Toyoko Koga, and Mariko Seo. 1 Sep 71, 6p ARDG (FE)-411
Grant DA-crd-afe-s92-544-71-g169
Availability: Pub. in Proceedings of the Society for Experimental Biology and Medicine, v140 n3 p842-845 Jul 72.

Descriptors: (*Arboviruses, Mutations), Tissue culture cells, Viruses, Growth.
Identifiers: *Sindbis virus, Plaques (Microbiology), Chicken embryo tissue culture.

A large plaque variant of Sindbis virus was obtained by repeatedly cloning after serial passage 50 times in chorioallantoic membrane in tissue culture. This virus has a high infectious titer in CEF cells as well as suckling mice. On the other hand, a small plaque of Sindbis virus obtained by the same method above using chick embryo brains instead of chorioallantoic membrane, grows to somewhat lower titer than that of the large plaque variant, and is not sensitive to agar inhibitors. (Author)

JPRS-57173 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
EPIZOOTOLOGICAL IMPORTANCE OF PASTEURELLA PESTIS STRAINS HAVING VARIOUS AMINO ACID REQUIREMENTS,
L. A. Peisakhis, and V. M. Stepanov. 3 Oct 72, 10p Trans. of Akademiya Nauk SSSR. Sibirskoe Otdelenie. Izvestiya. Seriya Biologicheskikh Nauk, p118-123 Dec 71.

Descriptors: (*Pasteurella pestis, Amino acids), Biochemistry, Bacteria, Nutritional requirements, Growth, Metabolism, Biosynthesis, Mutations, Animals, Translations, USSR.

The report contains a study of the virulence of natural Pasteurella pestis strains having various amino acid requirements.

N72-28042 PC$3.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
TESTS OF CHEMICAL COLD STERILIZATION OF SOME NUTRIENT MEDIA.
K. Luehrs. Jul 72, 4p NASA-TT-F-14412
Tran- Transl. Into English From Mykosen (Berlin), V. 14, No. 4, 1971 P 195-196

Descriptors: *Bacteria, *Chemical sterilization, *Nutrients, *Subzero temperature, Chemical reactions, Esters, Organic compounds.

For abstract, see STAR 10 19.

N72-28046 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
STRUCTURE OF THE YEAST CELL ENVELOPE.
T. Hirano. Jun 72, 20p NASA-TT-F-14308
Contract NASW-2035
Tran- Transl. Into English From Saibo (Japan), V. 3, No. 9, 1971 P15-21

Descriptors: *Bioassay, *Etching, *Freezing, *Membrane structures, *Yeast, Bibliographies, Chemical composition, Microbiology.

For abstract, see STAR 10 19.

N72-28047 PC$7.75/MF$0.95
Connecticut Univ., Storrs. Dept. of Pathobiology.
STUDIES OF EFFECTS OF CLOSED MICROBIAL ECOLOGY. REPORT OF 180-DAY TEST PERIOD.
A. J. Kenyon. 15 May 72, 114p NASA-CR-115678
Contract NAS9-10844

Descriptors: *Closed ecological systems, *Intestines, *Microorganisms, *Plants (botany), Bacteria, Gastrointestinal system.

For abstract, see STAR 10 19.

N72-28048 PC$6.25/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
MICROBIAL BURDEN PREDICTION MODEL FOR UNMANNED PLANETARY SPACECRAFT.
Final Report
A. R. Hoffman, and D. A. Winterburn. 30 Jun 72, 83p NASA-CR-127467, JPL-900-566
Contract NAS7-100

Descriptors: *Bioassay, *Computer programs, *Interplanetary spacecraft, *Microorganisms, Planetary quarantine, Prediction analysis techniques, Spacecraft sterilization.

For abstract, see STAR 10 19.

N72-28055 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
EVOLUTION OF THE ENDOGENOUS METABOLISM OF BAKERS YEAST (SACCHAROMYCES CEREVISIAE) AS A FUNCTION OF THE NATURE OF THE OXIDIZED EXOGENOUS SUBSTRATE (ACETATE, ETHANOL OR GLUCOSE).
M. Iscaki. Jul 72, 8p NASA-TT-F-14359
Contract NASW-2035
Tran- Transl. Into English From C. R. Soc. Biol. (Paris), V. 165, 1971 P 804-807

Descriptors: *Acetates, *Glucose, *Metabolism, *Yeast, Chemical reactions, Oxidation.

For abstract, see STAR 10 19.

N72-28058 PC$6.25/MF$0.95
Minnesota Univ., Minneapolis. School of Public Health.
ENVIRONMENTAL MICROBIOLOGY AS RELATED TO PLANETARY QUARANTINE.
Semiannual Progress Report
I. J. Iflug. Dec 71, 84p NASA-CR-127633, SAPR-7
Contract NGL-24-005-160

Descriptors: *Microorganisms, *Particle size distribution, *Soils, *Sterilization, Heat treatment, Lethality.

For abstract, see STAR 10 19.

N72-29075 PC$3.25/MF$0.95
Department of Health, Education, and Welfare, Phoenix, Ariz. Environmental Microbiology Section.
SERVICES PROVIDED IN SUPPORT OF THE PLANETARY QUARANTINE REQUIREMENTS.
M. S. Favero. Jun 72, 23p NASA-CR-127768, REPT-38
NASA ORDER W-13062

Descriptors: *Bacteria, *Cape kennedy launch complex, *Dry heat, *Spores, *Viability, Bioassay, Dust, Planetary quarantine.

For abstract, see STAR 10 20.

N72-30064 PC$7.25/MF$0.95
Sandia Labs., Albuquerque, N.Mex. Planetary Quarantine Dept.
PLANETARY QUARANTINE ACTIVITIES.
Final Report, Apr. 1965 - Jun. 1972
Aug 72, 101p NASA-CR-127835, SC-RR-72-0516
NASA ORDER W-12853

Descriptors: *Experimental design, *Planetary quarantine, *Spacecraft sterilization, Chemical sterilization, Dry heat, Radiation.

For abstract, see STAR 10 21.

N72-30065 PC$8.25/MF$0.95
Mississippi State Univ., State College. Dept. of Microbiology.
MICROBIAL DEGRADATION OF PARATHION.
Ph.D. Thesis
W. L. Gibson. Aug 72, 125p NASA-CR-127913
Contract NGL-25-001-040

Descriptors: *Bacteria, *Degradation, *Insecticides, Carbon, Microbiology, Organic phosphorus compounds.

For abstract, see STAR 10 21.

N72-30068 PC$5.25/MF$0.95
Mississippi State Univ., State College. Dept. of Microbiology.
ENHANCED DEGRADATION OF ALUMINUM METAL IN THE PRESENCE OF SELECTED MICROORGANISMS.
M.S. Thesis
J. M. Tennyson. Aug 72, 61p NASA-CR-127864
Contract NGL-25-001-028

Descriptors: *Aluminum, *Corrosion tests, *Microorganisms, Oxygen, Plastic coatings, Pressure effects.

For abstract, see STAR 10 21.

6N. Personnel Selection and Maintenance (Medical)

N72-30115 PC$3.50/MF$0.95
Indiana Univ., Bloomington. Div. of Optometry and Program in Physiological Optics.
THE VISUAL STANDARDS FOR THE SELECTION AND RETENTION OF ASTRONAUTS, PART 2.
M. J. Allen, J. R. Levene, and G. G. Heath. May 72, 29p NASA-CR-115763
Contract NAS9-9665

Descriptors: *Astronauts, *Optical measuring instruments, *Personnel selection, *Standards, Test equipment, Visual acuity, Visual discrimination, Visual tasks.

For abstract, see STAR 10 21.

6O. Pharmacology

AD-750 487 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
DEPENDENCE OF THE ENSLIN NUMBER ON THE VISCOSITY OF LIQUID COMPONENTS,
R. Huettenrauch, and I. Benesch. 20 Jul 72, 7p
Rept no. FTD-HC-23-1057-72
Unedited rough draft trans. from Pharmazie (East Germany) v26 n7 p439 1971.

Descriptors: (*Drugs, Production), (*Powders, Absorption), Tables, Viscosity, Mathematical models, East Germany.
Identifiers: Enslin number, Translations.

The influence of viscosity of liquids on the absorbability of a powder was studied. The Enslin no. increased as the viscosity of the liq. decreased. A linear relation is studied between the Enslin number and viscosity when the correlation coefficient changes very suddenly after reaching a threshold value. A practical example of application is described in coating tablets in which the water uptake of already dried layers is reduced when the viscosity of the coating liquid lies above the threshold value.

AD-750 790 PC$3.00/MF$0.95
Midwest Research Inst Kansas City Mo
SYNTHESIS OF ORGANIC COMPOUNDS FOR MALARIA CHEMOTHERAPEUTIC STUDIES.
Annual progress rept. no. 7, 1 Aug 71-31 Jul 72,
C. C. Cheng, Ping-Lu Chien, D. J. McCaustland, and William H. Burton. Sep 72, 80p
Contract DA-49-193-MD-2749
See also AD-734 362.

Descriptors: (*Antimalarials, Synthesis (Chemistry)), Molecular structure, Phenanthrenes, Methanols, Halogenated hydrocarbons, Fluorine compounds, Chlorine compounds, Bromine compounds, Polycyclic compounds, Piperidines, Plasmodium, Pharmacology.
Identifiers: *Phenanthrene methanols, Fluorine organic compounds.

The work reported herein consists of investigation in the following areas: Side chain modification study of 9-phenanthrenemethanols, Synthesis of certain aminonaphthalenes (deaza analogs of 6-amino- and 8-aminoquinoline), and Structural modification study of 2- (p-chlorophenyl)-2- (4-piperidyl)tetrahydrofuran. During the present report period, a total of 22 new compounds have been synthesized, characterized, and submitted for antimalarial evaluation. (Author)

AD-750 839 Reprint
School of Aerospace Medicine Brooks AFB Tex
SENSITIVE SPECTROPHOTOMETRIC METHOD FOR DETERMINING METHADONE IN BIOLOGIC SPECIMENS,
Jack E. Wallace, Horace E. Hamilton, James T. Payte, and Kenneth Blum. 2 May 72, 6p Rept no. SAM-TR-72-310
Contract AF-7753
Revision of report dated 15 Mar 72.
Availability: Pub. in Jnl. of Pharmaceutical Sciences, v61 n9 p1397-1400 Sep 72.

Descriptors: (*Drugs, Quantitative analysis), (*Narcotics, Quantitative analysis), (*Spectrophotometers, Drugs), Urine, Tissues (Biology), Body fluids, Chemical analysis.
Identifiers: *Methadone, Heroin addiction.

The extensive use of methadone for the treatment of opiate addiction increases significantly the need for quantitative determination of methadone in urine and tissues. Existing spectrophotometric methods are limited in sensitivity by the low molar absorptivity of this compound. Results demonstrate that a markedly enhanced sensitivity may be achieved by oxidizing the methadone to benzophenone. Methadone is extracted into n-hexane at an alkaline pH and then back-extracted into dilute sulfuric acid. Refluxing the acid solution with barium peroxide and n-heptane oxidizes the methadone to benzophenone, which is immediately extracted into the heptane. The heptane layer is removed and washed, and the benzophenone is measured spectrophotometrically. The method is sufficiently sensitive to quantitate therapeutic levels of methadone in small volumes of urine. (Author)

JPRS-57187 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
THE ROLE OF MIXED DISULFIDE BONDS IN THE RADIOPROTECTIVE EFFECT OF BETA - MERCAPTOETHYLAMINE (MEA),
I. V. Filippovich, Z. I. Zhulanova, V. B. Kolina, L. P. Mikhailova, and T. N. Sheremetevskaya. 4 Oct 72, 8p
Trans. of Akademiya Nauk SSSR. Doklady, v204 n4 p1006-1009 1972.

Descriptors: (*Radioprotective agents, Thiols), (*Biochemistry, Thiols), (*Pharmacology, Thiols), Organic sulfides, Proteins, Chemical bonds, Amides, Thymus gland, Liver, Spleen, USSR, Translations.
Identifiers: *Cysteamine.

The article gives results of an investigation of mixed disulfide bonds of mercaptoethylamine (MEA) with proteins of the thymus hyaloplasm and of some subcellular structures of the spleen and liver in rats at various time intervals after administration of the radioprotector to the animals. This is one of many investigations performed to determine the radioresistance of the animal organism after the radioprotector administration. (Author)

PB-212 462 PC$3.00/MF$0.95
Wisconsin Univ., Madison. Medical School.
PROTECTING ISCHEMIC MYOCARDIUM, MINIMIZING INFARCT SIZE, AND ENHANCING MYOCARDIAL REPAIR. EFFECTS OF ANGIOTENSIN POLYPEPTIDES ON MYOCARDIUM.
Annual rept. Jun-Dec 71,
Theodore L. Goodfriend. Feb 72, 14p NIH-NHLI-71-11-A72
Contract PHS-71-11

Descriptors: (*Myocardial infarction, Therapy), (*Ischemia, Myocardial infarction), (*Angiotensin, Myocardial infarction), Drug therapy, Pharmacology, Cardiovascular diseases, Adenosine phosphates, Oxygen consumption, Physiology, Pathology.

Analogs of angiotensin will be synthesized and evaluated for their ability to improve myocardial synthesis of ATP, to enhance myocardial contractility under ischemic conditions, to promote the survival of ischemic myocardium, and yet have minimal vasoconstrictive effects and antigenic effects.

6P. Physiology

AD-750 325 PC$3.00/MF$0.95
Army Medical Research and Nutrition Lab Denver Colo
THE EFFECT OF FOLATE ON ABNORMAL CARBOHYDRATE METABOLISM,
Harry L. Greene, Robert H. Herman, Fred B. Stifel, Yaye F. Herman, and Edward G. Lufkin. 1972, 15p

Descriptors: (*Carbohydrates, *Metabolic diseases), (*Folic acid, Carbohydrates), (*Vitamin B complex, Carbohydrates), Metabolism, Enzymes, Glycolysis, Deficiency diseases, Ethanols, Glucose.

It has been demonstrated that certain human glycolytic and one gluconeogenic enzymes showed adaptive changes in activity with dietary carbohydrate or pharmacologic doses of folic acid. Physiologic amounts of the vitamin did not cause as great a change in enzyme activity as was seen with pharmacologic doses of folate (1 mg/day or more) and the changes began within one hour and reached a maximum by 18 to 24 hours. The mechanism whereby folate caused this adaptive response is not known. These adaptive changes in enzyme activity occurred both in the jejunum and liver of rats. It is speculated that the human hepatic glycolytic enzymes might be affected similarly to the human jejunal enzymes. If this were so, then pharmacologic doses of folate might be useful to treat patients with a deficiency of fructose-1-phosphate aldolase (hereditary fructose intolerance) or fructose-1,6-diphosphatase (which causes a hypoglycemic syndrome). The use of folate in the treatment of two naturally occurring enzyme deficiency diseases and studies concerning the effect of ethanol-induced enzyme deficiency states is described.

AD-750 361 PC$3.00/MF$0.95
Army Medical Research Inst of Infectious Diseases Frederick Md
A MEDIATOR FOR TRIGGERING NON-SPECIFIC HOST DEFENSE MECHANISMS,
Robert S. Pekarek, and Robert W. Wannemacher, Jr. 1972, 12p

Descriptors: (*Infectious diseases, *Metabolism), (*Immunology, Metabolism), Leukocytes, Phagocytes, Gamma globulin, Amino acids, Metals, Pyrogens.

Prospective clinical studies in volunteers have shown that experimentally-induce bacterial or viral infections induce alterations early in the prodromal period in a variety of anabolism-related metabolic processes. Studies in experimental animals and man have shown that the mechanisms leading to these host changes were mediated by an endogenous humoral factor which enters the serum. This heat labile endogenous mediator, like endogenous pyrogen, was released by PMN leuko-

cytes and possibly other cells after the initiation of a generalized infection. Endogenous mediator may prove to be a key intermediate in stimulation of various non-specific host defense mechanisms.

AD-750 426 Reprint
California Univ Los Angeles Brain Research Inst
ORGANIZATION OF BRAIN TISSUE: IS THE BRAIN A NOISY PROCESSOR,
W. Ross Adey. 16 Dec 70, 15p
Contracts F44620-70-C-0017, N00014-69-A-0200-4020
Supported in part by Contracts AF 49 (638)-1387, and Grants PHS-NB-01883, PHS-MH-03708, NGR-05-007-195.
Availability: Pub. in the International Journal of Neuroscience, v3 p271-284 1972.

Descriptors: (*Brain, *Tissues (Biology)), Central nervous system, Electroencephalography, Nerve cells, Behavior, Learning, Memory.
Identifiers: *Information processing (Psychology).

The paper presents some thoughts on functional organization in cerebral tissue. 'Spontaneous' wave and unit firing are considered as essentail phenomena in the handling of information. Various models are discussed which have been suggested to describe the pseudorandom behavior of brain cells, leading to a view of the brain as an information processor and its role in learning, memory, remembering and forgetting. (Author)

AD-750 455 Reprint
Naval Medical Research Inst Bethesda Md
CARBON MONOXIDE AND METHANE PRODUCTION IN RATS, GUINEA PIGS, AND GERM-FREE RATS.
Medical research progress rept. no. 6,
F. Lee Rodkey, Harold A. Collison, and John D. O'Neal. 10 Dec 71, 7p
Availability: Pub. in Jnl. of Applied Physiology, v33 n2 p256-260 Aug 72.

Descriptors: (*Carbon monoxide, Metabolism), (*Methane, Metabolism), Animals, Germ-free animals, Hemoglobin, Respiration, Physiology.

A closed rebreathing system was devised to measure trace gas production by individual animals. The apparatus was used to measure the production of carbon monoxide and methane by normal control rats and guinea pigs and by germ-free rats. Total body hemoglobin was also estimated by the CO-dilution technique. A significant difference in CO production was observed between male and female control rats but their methane production was not significantly different. Germ-free female rats produce CO at the same rate as normal controls but produce no methane. Guinea pigs produce and average of 5 times as much methane per kilogram body weight as do rats, whereas their CO production per kilogram body weight is nearly identical to that of female rats. All animals tested produced more carbon monoxide than could be accounted for by the normal turnover of hemoglobin, suggesting that CO may be produced from nonheme sources. (Author)

AD-750 588 PC$3.00/MF$0.95
European Research Office London (England)
PATTERNS OF ORGANIZATION IN THE NERVOUS SYSTEM AND THEIR DEVELOPMENT: NOTES ON A SYMPOSIUM.
Technical rept.,
John B. Bateman. Oct 72, 23p Rept no. ERO-11-72

Descriptors: (*Nervous system, Physiology), Symposia, Neurology, Neuromuscular transmission, Brain, Central nervous system, Nerve cells, Great Britain.
Identifiers: *Neurophysiology.

Contents:
The sixth international meeting of neurobiologists;
Trophic interactions between nerve and muscle;
Neuroglial involvement in synaptic remodelling;
Program and abstracts;
List of members.

N72-28033 PC$3.25/MF$0.95
Illinois Univ., Urbana. Engineering Experiment Station.
ANALYTICAL PREDICTION OF THE HEAT TRANSFER FROM A BLOOD VESSEL NEAR THE SKIN SURFACE WHEN COOLED BY A SYMMETRICAL COOLING STRIP.
J. C. Chato, and A. Shitzer. Dec 71, 25p
NASA-CR-127460, ME-TR-344
Contract NGR-14-005-103

Descriptors: *Arteries, *Bionics, *Heat transfer, *Skin temperature (biology), Hypothermia, Temperature distribution, Thermoregulation.

For abstract, see STAR 10 19.

N72-28039 PC$3.00/MF$0.95
Electronic Associates, Inc., Long Branch, N.J.
THE STUDY OF HUMAN VENOUS SYSTEM DYNAMICS USING HYBRID COMPUTER MODELING.
M. F. Snyder, and V. C. Rideout. Jul 72, 33p
NASA-CR-2084
Contract NGR-50-002-083
Subm- Prepared Jointly With Medical Physics Inst., Utrecht, Holland

Descriptors: *Bionics, *Cardiovascular system, *Hybrid computers, *Mathematical models, Graphs (charts), Hemodynamics, Real time operation.

For abstract, see STAR 10 19.

N72-28043 PC$5.75/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
MATHEMATICAL MODELS OF THERMOREGULATION AND HEAT TRANSFER IN MAMMALS. A COMPENDIUM OF RESEARCH.
A. Shitzer. Jul 72, 75p NASA-TM-X-62172

Descriptors: *Bibliographies, *Heat transfer, *Mammals, *Mathematical models, *Thermoregulation, Abstracts, Tables (data).

For abstract, see STAR 10 19.

N72-28054 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
PHYSIOLOGY THE EFFECT OF THYROCALCITONINE ON THE RENAL EXCRETION OF SODIUM AND CHLORIDES IN NORMAL MAN.
R. Ardaillou, G. Milhaud, F. Rousselet, P. Vuagnat, and G. Richet. Jul 72, 7p
NASA-TT-F-14356
Contract NASW-2035
Tran- Transl. Into English From Compt. Rend., Ser. D (Paris), V. 264, 1967 P 3037-3040

Descriptors: *Chlorides, *Human body, *Sodium, *Urination, Calcium compounds, Statistical analysis, Thyroxine.

For abstract, see STAR 10 19.

N72-28056 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
FACTORS THAT MODIFY THE BIOSYNTHESIS OF SATURATED FATTY ACIDS IN THE ENDOPLASMIC RETICULUM.
R. R. Brenner, A. Catala, and S. A. Dato. Jul 72, 12p NASA-TT-F-14357
Contract NASW-2035
Tran- Transl. Into English From Acta Cient. Venezolana (Caracas), V. 22, Suppl. 2, 1971 P 143-146

Descriptors: *Biosynthesis, *Circadian rhythms, *Diabetes mellitus, *Fatty acids, *Liver, Adenosine triphosphate (atp), Diets, Enzyme activity, Insulin, Proteins.

For abstract, see STAR 10 19.

N72-28060 PC$3.00/MF$0.95
Naval Aerospace Medical Research Lab., Pensacola, Fla.
RHESUS MONKEY HEART RATE DURING EXERCISE.
J. Delorge, and J. S. Thach, Jr. Apr 72, 15p
NASA-CR-127696
NASA ORDER L-27432

Descriptors: *Exercise (physiology), *Heart rate, *Monkeys, Aerospace environments, Scheduling.

For abstract, see STAR 10 19.

N72-30056 PC$3.00/MF$0.95
Mississippi Univ., Jackson. Dept. of Physiology and Biophysics.
DIGITAL SIMULATION AND EXPERIMENTAL EVALUATION OF THE CO2-H (PLUS) CONTROL OF PULMONARY VENTILATION.
Final Technical Report
H. T. Milhorn, Jr., and W. J. Reynolds. 28 Jun 72, 13p NASA-CR-127819
Contract NGR-25-002-015

Descriptors: *Carbon dioxide, *Computerized simulation, *Digital computers, *Pulmonary functions, *Respiration, Biodynamics, Human reactions, Respiratory system.

For abstract, see STAR 10 21.

N72-30070 PC$12.50/MF$0.95
George Washington Univ., Washington, D.C. Dept. of Medical and Public Affairs.
INFORMATION SERVICES FOR COMPARATIVE ANALYSIS OF BIORHYTHM RESERACH.
Final Report
May 72, 210p NASA-CR-114487
Contract NAS2-6216

Descriptors: *Abstracts, *Bibliographies, *Rhythm (biology), Alcohols, Drugs, Pharmacology, Rapid eye movement state, Steroids, Stresses, Toxic hazards.

For abstract, see STAR 10 21.

6Q. Protective Equipment

AD-750 830 PC$3.00/MF$0.95
Defence Research Information Centre Orpington (England)
ASSESSMENT OF THE THERMAL RESISTANCE OF CLOTHING,
Yu. F. Voinov, and K. V. Karlina. Oct 72, 9p Rept nos. DRIC-Trans-2920, DRIC-BR-30290
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Tekhnologiya Logkoi Promyshlennosti (USSR) n1 p80-84 1972, by B. F. Toms.

Descriptors: (*Heat-resistant materials, Protective clothing), (*Protective clothing, *Thermal properties), Heat transfer, Stress (Physiology), Mathematical models, Thickness, Costs, Design, USSR.
Identifiers: Translations, Thermal resistance.

In the thermal resistance of clothing a substantial part may be played by any of the components of the thermal resistance depending on the thickness of the clothing and the magnitude of its overall thermal resistance. (Author)

N72-29091 PC$5.75/MF$0.95
Royal Aircraft Establishment, Farnborough (England). Engineering Physics Dept.
THE DYNAMIC BEHAVIOUR OF CRASH HELMETS.
J. M. Rayne. 1972, 73p ARC-CP-1202, RAE-TR-69160
Misc 0supersedes Rae-tr-69160 Arc-31726

Descriptors: *Crash injuries, *Dynamic tests, *Helmets, *Safety devices, Buffeting, Human factors engineering, Impact tests, Load distribution (forces), Performance prediction, Skull.

For abstract, see STAR 10 20.

PB-212 697 PC$3.00/MF$0.95
Bureau of Mines, Washington, D.C.
RESPIRATORS APPROVED BY THE BUREAU OF MINES AS OF MAY 24, 1972.
Information circular,
Edwin J. Kloos, and Robert H. Schutz. 1972, 17p BuMines-IC-8559
Prepared in cooperation with Bureau of Mines, Pittsburgh, Pa. Pittsburgh Technical Support Group. Revision of Rept. no. BuMines-IC-8436.

Descriptors: (*Respirators, Coal mining), (*Protective masks, Coal mining), Breathing apparatus, Standards, Filters.

The publication lists devices approved jointly by the Secretary of the Interior and the Secretary of Health, Education, and Welfare, as of May 24, 1972, under provisions of 11.2, Part 11, Subchapter B of Chapter 1, Title 30 Code of Federal Regulations (37 F.R. 6244, March 25, 1972), for use in mines as respiratory protection in oxygen-deficient atmospheres, and in gases, vapors, dusts, fumes, and mists. Included are self-contained breathing apparatus, gas masks, and supplied-air, dust, fume, mist, and chemical-cartridge respirators. Names and addresses of manufacturers appear in the Appendix.

6R. Radiobiology

AD-750 350 PC$3.00/MF$0.95
Frankford Arsenal Philadelphia Pa
OCULAR HAZARD OF THE GAAS LASER,
David J. Lund, Charles C. Carver, and R. Bruce Bedell. 1972, 9p

Descriptors: (*Lasers, *Safety), (*Eye, *Radiation injuries), Semiconductor devices, Coherent radiation, Hazards, Laboratory animals, Monkeys, Test methods, Gallium, Arsenic, Night vision, Warning systems, Thresholds (Physiology).
Identifiers: *Gallium arsenide lasers, Ocular damage.

The GaAs laser is used in intrusion alarm systems, secure communication links, and short distance range-finders. By use of multiple diode arrays, high average power visually covert illumination is possible for night vision and range gated systems. Each of these applications exposes human eyes to GaAs laser radiation, and thus it is necessary to determine the ocular hazard of these lasers. An experimental determination is reported of the damage threshold of ocular damage using a GaAs laser. (Author)

AD-750 394 PC$3.00/MF$0.95
Frankford Arsenal Philadelphia Pa
SPECTRAL DEFICITS IN VISUAL ACUITY DUE TO LASER IRRADIATION,
Harry Zwick, R. Bruce Bedell, and Kenneth Bloom. 1972, 11p
Joint AMRDC-AMC Laser Safety Team.

Descriptors: (*Visual acuity, Radiation effects), (*Lasers, *Radiation effects), Vision, Radiation hazards, Color vision, Ophthalmology.
Identifiers: *Laser radiobiology, Ruby lasers.

The increased use of lasers and laser devices has made it essential to determine the potential kinds of visual deficits associated with accidental laser exposure. Maximal visual acuity and normal color vision are closely associated with foveal receptor function. When the fovea is destroyed by laser irradiation, severe and permanent losses in visual acuity ensue. The purpose of the study was the determination of permanent photopic or color deficits in animal subjects following foveal injury produced by ruby laser irradiation.

AD-750 499 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE FUNCTIONAL STATE OF THE VISUAL AND VESTIBULAR ANALYZERS OF THOSE WHO WORK WITH SMALL DOSES OF IONIZING EMISSIONS,
Ts. P. Medvedovskaya, and V. N. Shepelev. 2 Aug 72, 9p Rept no. FTD-MT-24-99-72
Edited machine trans. of Gigiena Truda i Professionalnye Zabolevaniya (USSR) n9 p44-46 1970, by Bernard L. Tauber.

Descriptors: (*Vision, Radiation effects), (*Vestibular apparatus, Radiation effects), Ophthalmology, Nervous system, Brain, Cerebral cortex, Radiological dosage, Optic nerve, Nuclear reactors, Blood pressure, Eye, USSR.
Identifiers: Translations, Ionizing radiation.

A study of 199 persons working with the VVP-M research reactor integral operator dose 15 to 20 rem is reported. No significant changes in functional state of the visual and vestibular analyzers were detected. Reversible changes such as reduced sensitivity to red and green, enlarged blind spot, depression of vestibular function, and reduced size and altered blood pressure in vessels of the fundus oculi reflect changes in the functional state of the higher nervous system, and of the cerebral cortex in particular. (Author)

AD-750 681 PC$3.00/MF$0.95
Armed Forces Radiobiology Research Inst Bethesda Md
BLOOD PO2 AND PH IN MONKEYS AFTER INCAPACITATING DOSES OF IONIZING RADIATION.
Technical note,
J. W. Thorp. Jun 72, 18p Rept no. AFRRI-TN72-3

Descriptors: (*Radiation effects, Nuclear radiation), (*Blood, *Oxygen), pH, Hypoxia, Brain, Radiological dosage, Gamma rays, Neutrons.
Identifiers: *Ionizing radiation.

Aortic blood PO2 and pH and internal jugular blood PO2 were measured continuously in monkeys (Macaca mulatta) that received a 3000-rad midline tissue dose pulse of mixed gamma-neutron radiation. Immediately after irradiation the aortic blood PO2 and pH increased slightly (5 to 10 torr and 0.05 pH unit, respectively); these changes were consistent with earlier reports that monkeys hyperventilated after similar irradiation. Venous blood PO2 did not change after irradiation. It was concluded that lack of oxygen in the blood does not contribute to radiation-induced early transient incapacitation (ETI). If brain hypoxia does cause ETI, it must result from inadequate blood supply to all or part of the brain. (Author)

JPRS-57289 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
HYGIENIC PROBLEMS OF THE EFFECT OF MICROWAVE ELECTROMAGNETIC FIELDS ON THE BODY,
M. P. Troyanskii. 10 Oct 72, 10p
Trans. of Gigiena i Sanitariya (USSR) n8 p87-92 1972.

Descriptors: (*Microwaves, *Radiobiology), Radiation effects, Humans, Exposure, Permissible dosage, Radiation dosage, Protection, Electromagnetic radiation.

The article studies the harmful effects of microwave fields on the human body, the determination of maximum permissible human exposure levels, and the development of preventive and protective measures.

N72-28040 PC$3.00/MF$0.95
Battelle-northwest, Richland, Wash.
THE MEASUREMENT OF RADIATION EXPOSURE OF ASTRONAUTS BY RADIOCHEMICAL TECHNIQUES.
Quarterly Research Report, 5 Jul. - 3 Oct. 1971
R. L. Brodzinski. 15 Oct 71, 19p
NASA-CR-127563, BNWL-1183-10
Contract AT (45-1)-1830
Subm- Sponsored By Nasa

Descriptors: *Apollo 15 flight, *Feces, *Radioactive isotopes, *Radiochemical separation, *Urine, Aerospace environments, Astronauts, Radiation measurement, Trace elements.

For abstract, see STAR 10 19.

N72-28057 PC$3.00/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SURVIVAL OF BACTERIAL ISOLATES EXPOSED TO SIMULATED JOVIAN TRAPPED RADIATION BELT ELECTRONS AND SOLAR WIND PROTONS.
D. M. Taylor, C. A. Hagen, G. M. Renninger, G. J. Simko, and C. D. Smith. 1972, 16p
NASA-CR-127568, PQ-7
Contract NAS7-100
Subm- Prepared in Cooperation With Bionetics Corp., Pasadena, Calif.

Descriptors: *Bacteria, *Jupiter probes, *Radiation effects, *Solar protons, *Solar wind, *Trapped particles, Astronomical models, Flux density, Radiation belts, Spacecraft sterilization.

For abstract, see STAR 10 19.

N72-28063 PC$5.00/MF$0.95
Houston Univ., Tex. Coll. of Optometry.
THE HUMAN, PRIMATE AND RABBIT ULTRAVIOLET ACTION SPECTRA.
D. G. Pitts, and W. D. Gibbons. 31 Mar 72, 59p
NASA-CR-115742
Contract NAS9-10836
Subm- Submitted for Publication

Descriptors: *Oculomotor nerves, *Photosensitivity, *Radiation damage, *Ultraviolet radiation, Biomedical data, Clinical medicine, Human beings, Primates, Rabbits.

For abstract, see STAR 10 19.

N72-30057 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
COMPARATIVE CHARACTERISTICS OF NUCLEOTIDE DNA BLOCKS IN RADIATION INJURY AND LEUKOSIS.
A. Oparin. Aug 72, 8p NASA-TT-F-14520
Contract NASW-2035
Tran- Transl. Into English From Dokl. Akad. Nauk Sssr (Moscow), V. 203, No. 1, Mar. - Apr. 1972 P 233-236

Descriptors: *Deoxyribonucleic acid, *Hematopoietic system, *Leukemias, *Radiation injuries, Cancer, Ionizing radiation, Radiation damage, Radiobiology.

For abstract, see STAR 10 21.

PB-212 491 PC$3.00/MF$0.95
Bureau of Radiological Health, Rockville, Md. Div. of Medical Radiation Exposure.
REDUCTION OF RADIATION DOSE IN DIAGNOSTIC X-RAY PROCEDURES.
Sep 72, 280p BRH/DMRE-73-1 FDA-73-8009
Proceedings of a Symposium held in Houston, Texas, 8 Jul 71.

Descriptors: (*Diagnostic agents, X rays), (*X rays, *Health physics), Clinical medicine, Radiology, Dosimentry, Standards, Meetings.

A symposium on reduction of radiation dose in diagnostic x ray was held in Houston, Texas, on July 8, 1971, to improve communication between users of diagnostic x-ray equipment, physicists, government agencies and professional organizations concerned with radiation use responsibilities. Radiation safety in the practice of diagnostic radiology and in the operation of medical x-ray facilities was discussed from the viewpoints of user-oriented personnel, individuals concerned primarily with radiation safety, and organizations responsible for developing radiation protection guides, standards, and regulations.

PB-212 531 PC-GPO/MF$0.95
Bureau of Radiological Health, Rockville, Md. Office of Information.
ANNUAL NATIONAL CONFERENCE ON RADIATION CONTROL-SAVE A RAD (4TH), HELD AT NEW ORLEANS, LOUISIANA, APRIL 30-MAY 4, 1972.
Jul 72, 311p BRH/OBD-73-3 FDA-73-8003
See also Annual rept. no. 3, PB-206 981. Paper copy available from GPO $3.50 as stock no. SN-1715-00038.

Descriptors: (*Radiobiology, Meetings), (*Radiation, Control), Radiology, Medicine, Dentistry, Radiation hazards, Public health, Exposure, X rays, Radioactive contaminants, Nuclear power plants, Projects, Environments, Standards, Regulations, National government, State government.

Contents:
- The environmental protection agency's response to environmental radiation control issues;
- X-ray exposure study and trends;
- Implementation of the x-ray performance standards;
- Mission of the Office of Radiation Programs;
- National Quality Control Program;
- Radiation standards and criteria;
- Revision of the Council of State Governments' 'Suggested State Regulations for the Control of Radiation';
- A State X-Ray Program Effectiveness Index (SEI);
- Optimum x-ray survey procedures.

6S. Stress Physiology

AD-750 310 PC$3.00/MF$0.95
Army Research Inst of Environmental Medicine Natick Mass
ACID-BASE CHANGES IN HEAT EXHAUSTION DURING BASIC TRAINING,
A. E. Boyd, III., and George A. Beller. 1972, 12p

Descriptors: (*Heat tolerance, Army research), Hyperventilation, Lactates, Stress (Physiology), Diagnosis, Exercise, Acids, Bases (Chemistry), Statistical data, pH, Carbon dioxide.
Identifiers: *Heat exhaustion, Heat stroke, Acid base physiology, Respiratory alkalosis, Recruits.

The results of the study indicate that heat exhaustion, as seen in recruits in basic training, is associated with a marked respiratory alkalosis. (Author)

AD-750 345 PC$3.00/MF$0.95
Army Tank-Automotive Command Warren Mich
THE EFFECTS OF VIBRATION ON VISION AS APPLIED TO MILITARY VEHICLES,
Richard A. Lee. 1972, 15p

Descriptors: (*Stress (Physiology), Army personnel), (*Visual acuity, Vibration), (*Performance (Human), Tracked vehicles), Performance tests, Simulators, Target discrimination, Mathematical models, Transfer functions, Test methods, Test equipment, Responses, Males.
Identifiers: *Whole body vibration, *Computer aided analysis.

The objective of the study was to quantify the loss of visual acuity during whole-body vibration of a seated human. To obtain accurate measurements of eye motion during whole-body vibration, a target was set up in front of a vibration simulator.

AD-750 558 PC$3.00/MF$0.95
Flying Personnel Research Committee London (England)
A THEORETICAL MODEL OF THE UTRICULAR OTOLITH AND ITS RESPONSE TO ANGULAR MOTION WITH RESPECT TO AN ACCELERATION IN SHEAR,
G. R. Barnes. Apr 72, 50p Rept no. FPRC/1315
Revision of report dated Jul 71.

Descriptors: (*Vestibular apparatus, Acceleration tolerance), Stress (Physiology), Responses, Models (Simulations), Ear, Semicircular canals, Great Britain.
Identifiers: *Angular acceleration stress, *Otolith system, Otoconia.

A theoretical model is developed for the utricular otolith and its associated neural connections to the oculomotor system, based upon established anatomical and electrophysiological features. The dynamic behaviour of the model is analysed, particularly in its response to angular motion with respect to an acceleration in shear. The predictions of the model with appropriate restraints are compared with data from experiments carried out in man. (Author)

AD-750 686 PC$3.00/MF$0.95
Naval Medical Research Inst Bethesda Md
A BIBLIOGRAPHY OF THE ROLE OF THE VESTIBULAR APPARATUS UNDER WATER AND PRESSURE: CONTENT-ORIENTED AND ANNOTATED.
Medical research progress rept. no. 1,
Robert S. Kennedy. 10 Aug 72, 135p

Descriptors: (*Vestibular apparatus, *Diving), (*Bibliographies, Vestibular apparatus), Stress (Physiology), High-pressure research, Decompression sickness, Perception, Auditory perception, Environment.
Identifiers: *Hyperbaric medicine, Hyperbaric atmospheres.

The report contains approximately 965 references dealing with the role of the vestibular apparatus in compressed air work. The references are sorted by subject matter into six categories: Vestibular symptomatology as a sign of decompression sickness; Clinical investigation of vestibular symptomatology; Tests of positive function of vestibular apparatus; Perceptual illusions occasioned by the environment; The use of the vestibular system as an inertial guidance system; Auditory studies which have relevance for understanding vestibular function underwater. (Author)

AD-750 840 Reprint
Aerospace Medical Research Lab Wright-Patterson AFB Ohio
EFFECTS OF INCREASING INTENSITY LEVELS OF INTERMITTENT AND CONTINUOUS 1000-HZ TONES ON HUMAN EQUILIBRIUM,
C. Stanley Harris. 16 Jun 72, 10p Rept no. AMRL-TR-72-11
Availability: Pub. in the Perceptual and Motor Skills, v35 p395-405 1972.

Descriptors: (*Equilibrium, *Noise), Vestibular apparatus, Stimulation, Perception, Vertigo, Stress (Physiology).

Human equilibrium was measured during exposure to continuous and intermittent 1000-Hz tones presented both asymmetrically (ONE EAR) and symmetrically (both ears). Intermittency combined with asymmetry produced greater decrements in equilibrium than either variable alone. The results are interpreted as a possible demonstration of acoustic stimulation of the vestibular system. (Author)

AD-750 859 Reprint
North Dakota Univ Grand Forks School of Medicine
UNCONJUGATED URINARY CORTICOSTERONE EXCRETION IN LABORATORY RATS EXPOSED TO HIGH PRESSURE HELIUM-OXYGEN ENVIRONMENTS,
R. A. Bitter, and T. W. Nielsen. 1972, 5p
Contract N00014-68-A-0499
Availability: Pub. in Aerospace Medicine, v43 n9 p984-988 Sep 72.

Descriptors: (*Corticosteroid agents, *High-pressure research), (*Stress (Physiology), Diving), Adrenal glands, Adrenal cortex hormones, Pressure, Environment, Oxygen, Helium.
Identifiers: Hyperbaric atmospheres, Helium oxygen atmospheres.

The excretion rate of unconjugated urinary corticosterone collected from male Sprague-Dawley rats (250-400 gm) was used as an index of stress. Twenty-four-hour urine samples were collected during control periods in room air (N2-O2) and during exposure to a mixture (80-20%) of helium-oxygen (He-O2) at 1 atmosphere absolute (ATA). The animals were then exposed to HeO2 mixtures at 5, 10, 20, or 30 ATA for 14 hours and then stage decompressed. Unconjugated urinary corticosterone was analyzed fluorometrically and expressed at ng/100 gm body weight/24 hours. Statistically significant increases in corticosterone excretion rates were found in HeO2 control samples above those excretion rates collected in N2O2 samples. Excretion values of corticosterone were increased as much as three-fold over basal values upon exposure to pressure. Urine volume and creatinine excretion both showed general increases with a change to He-O2 and to increased pressures. Loss of body weight was observed with pressures greater than 5 ATA He-O2. (Author)

AD-750 914 Reprint
Beth Israel Medical Center New York
NEWER CONCEPTS ON THE MECHANISM AND PREVENTION OF DECOMPRESSION SICKNESS,
C. Chryssanthou, F. Teichner, G. Goldstein, and W. Antopol. 1972, 2p
Contract N00014-68-A-0393-0001
Prepared in cooperation with Mount Sinai School of Medicine, New York.
Availability: Pub. in the Abstracts of Papers Presented at International Congress of Aviation and Space Medicine (20th) Nice (France) 18-21 Sep 72, p66.

Descriptors: (*Decompression sickness, Pathology), (*Pharmacology, Decompression sickness), Antihistaminics, Aviation medicine, Space medicine, Inhibition, Histamine, Phenothiazines, France.
Identifiers: Bradykinin, Indol-5-ol/3- (2-aminoethyl), Cyclohexanone/phenyl-piperazinylmethyl, Phenothiazine sulfonamide/(dimethylamino)propyl-N-N-dimethyl.

There is evidence suggesting that smooth muscle stimulating substances such as bradykinin (BK), histamine (H), 5-hydroxytryptamine (5HT), etc.,

are implicated in the pathogenesis of decompression sickness (DS). This hypothesis is based on the following observations: BK intensifies pathologic alterations and increases mortality in DS. compounds with anti-bk and anti-H activity such as 2-(4-phenyl-piperazinylmethyl)cyclohexanone (PPCH) prevent or ameliorate development of DS in mice, hamsters and rats. Current experiments suggest that dimethothiazine (Migristene) which combines anti-H, anti-5HT and anti-BK activities can also prevent DS in mice. A new humoral Smooth Muscle-Acting Factor (SMAF), was recently found in blood and tissues of a variety of animal species including humans. SMAF activity increases in DS. PPCH counteracts this effect of SMAF AND PREVENTS DS. Smooth muscle stimulating factors released or activated in DS can induce tissue responses that could contribute to the production of the syndrome. The postulated implication of such humoral factors in the mechanism of DS, brings up new pathogenetic considerations and provides the basis for a novel pharmacological approach for the prevention or amelioration of this malady.

N72-28037 PC$6.25/MF$0.95
Michigan Univ., Ann Arbor. School of Natural Resources.
REMOTE SENSING OF CHANGES IN MORPHOLOGY AND PHYSIOLOGY OF TREES UNDER STRESS.
Annual Progress Report
C. E. Olson, W. G. Rohde, and J. M. Ward. 30 Sep 71, 84p NASA-CR-127640, APR-5
NASA ORDER W-13308
Subm- Prepared for Calif. Univ., Berkeley. Forestry Remote Sensing Lab. in Cooperation With Dept. of Agr. Forest Serv.

Descriptors: *Remote sensors, *Sodium chlorides, *Stress (biology), *Trees (plants), *Water deprivation, Aerial photography, Earth resources, Foliage, Multispectral photography, Spectral reflectance.

For abstract, see STAR 10 19.

N72-28041 PC-GPO/MF$0.95-NTIS
PROJECT TEKTITE 1 A MULTIAGENCY 60--DAY SATURATED DIVE.
D. C. Pauli, and Cole H. A.. 16 Jan 70, 413p
NASA-CR-127689, ONR-DR-153
Subm- Sponsored in Part By Nasa, Dept. of Interior, and Gen. Elec. Paper copy available from GPO $3.00

Descriptors: *Diving (underwater), *Physical sciences, *Stress (physiology), *Stress (psychology), *Tektite project, Biomedical data, Environmental control, Human factors engineering, Underwater engineering.

For abstract, see STAR 10 19.

N72-28059 PC$3.00/MF$0.95
Naval Aerospace Medical Research Lab., Pensacola, Fla.
ALTERED SUSCEPTIBILITY TO MOTION SICKNESS AS A FUNCTION OF SUBGRAVITY LEVEL.
E. F. Miller, II, and A. Graybiel. 23 Nov 71, 20p
NASA-CR-127687, NAMRL-1150
NASA ORDER T-81633, NASA ORDER L-43518

Descriptors: *Motion sickness, *Reduced gravity, Acceleration stresses (physiology), Acceleration tolerance, Gravitational effects.

For abstract, see STAR 10 19.

N72-29086 PC$3.00/MF$0.95
Stanford Research Inst., Menlo Park, Calif.
PERCEIVED NOISINESS UNDER ANECHOIC, SEMI-REVERBERANT AND EARPHONE LISTENING CONDITIONS.
F. R. Clarke, and K. D. Kryter. Aug 72, 30p
NASA-CR-2108
Contract NAS1-10017

Descriptors: *Aircraft noise, *Noise tolerance, *Psychoacoustics, Anechoic chambers, Auditory perception, Auditory stimuli, Earphones, Physiological tests, Reverberation.

For abstract, see STAR 10 20.

N72-29087 PC$3.00/MF$0.95
Stanford Research Inst., Menlo Park, Calif.
THE METHODS OF PAIRED COMPARISONS AND MAGNITUDE ESTIMATION IN JUDGING THE NOISINESS OF AIRCRAFT.
F. R. Clarke, and K. D. Kryter. Aug 72, 40p
NASA-CR-2107
Contract NAS1-10017

Descriptors: *Acoustic measurements, *Aerodynamic noise, *Aircraft noise, *Auditory stimuli, Estimating, Human performance, Human tolerances.

For abstract, see STAR 10 20.

N72-30055 PC$19.75/MF$0.95
Milan Univ. (Italy). Dept. of Human Physiology.
ORBITING FROG OTOLITH EXPERIMENT (OFO-A) DATA REDUCTION AND CONTROL EXPERIMENTATION.
Final Report
T. Gualtierotti, F. Bracchi, and E. Rocca. Jan 72, 353p NASA-CR-62084
Contract NASW-2211

Descriptors: *Orbiting frog otolith, *Vestibular tests, Gravitation, Weightlessness.

For abstract, see STAR 10 21.

N72-30058 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
MECHANISMS OF CHANGES IN ENZYME ACTIVITY IN THE SMALL INTESTINE AT HIGH TEMPERATURES.
A. Y. Yunusov, K. Rakhimov, U. Z. Kadyrov, and N. A. Korotkina. Aug 72, 5p NASA-TT-F-14521
Contract NASW-2035
Tran- Transl. Into English From Uzbeksk. Biol. Za. (Tashkent), No. 6, Nov. - Dec. 1971 P 21-23

Descriptors: *Dehydration, *Enzyme activity, *High temperature, *Intestines, *Rodents, *Solar radiation, Carbohydrates, Hydrolysis, Proteins, Water deprivation.

For abstract, see STAR 10 21.

N72-30059 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
ROLE OF MITOCHONDRIAL BIOGENESIS IN ADAPTATION OF THE ORGANISM TO ALTITUDE HYPOXIA.
F. Meyerson, V. Pomoynitskiy, and B. Yampolskaya. Aug 72, 9p NASA-TT-F-14524
Contract NASW-2035
Tran- Transl. Into English From Dokl. Akad. Nauk Ssr (Moscow), 1972 P 973-976

Descriptors: *Deoxyribonucleic acid, *Heart, *High altitude, *Hypoxia, *Mitochondria, *Ribonucleic acids, Biological evolution, Proteins, Rats.

For abstract, see STAR 10 21.

6T. Toxicology

AD-750 460 Reprint
Naval Medical Research Inst Bethesda Md
SPECIES VARIATION IN SENSITIVITY OF MAMMALIAN NEUROMUSCULAR TISSUES TO TOXIC ACTIONS OF STEROIDAL SAPONINS.
Medical research progress rept. no. 66,
S. L. Friess, W. L. Fink, R. C. Durant, and J. D. Chanley. 13 Jan 72, 8p
Availability: Pub. in Toxicon, v10 p393-398 1972.

Descriptors: (*Glycosides, Toxicity), (*Neuromuscular transmission, Glycosides), Muscles, Nerve cells, Tissues (Biology), Mammals.
Identifiers: Halothurin A.

The in vitro sensitivities of phrenic nerve-diaphragm preparations from the guinea pig, the mongrel cat and dog to the toxic actions of the marine steroidal saponins Holothurin A and its desulfated derivative have been studied under isotonic and isometric twitch response conditions. In isotonic response mode, the decreasing order of sensitivity to irreversible blockade by either saponin at the 1.0 x 0.0001 incubation levels follows the sequence: P>C> or =D. This order in general parallels the relative incidence of red fiber content associated with the three muscle tissues. On shifting to isometric response mode, the saponin potency sequency in blockade of twitch response undergoes a partial species inversion and becomes D>C=P. Possible explanations for these findings have been sought in terms of the relative red/white fiber contents of the muscle tissues, and the possibility that uncontracted red fibers furnish the primary target for attack by the saponin toxins. (Author)

COM-72-11361 Reprint
Maryland Fish and Wildlife Administration, Annapolis.
FURTHER STUDIES ON THE PURIFICATION AND PHYSIOLOGICAL ACTIONS OF SEA NETTLE TOXIN (35983),
Joseph W. Burnett, William Michael Gould, and Helene Rubinstein. 1 Jul 71, 5p NOAA-72091981
Contract DI-14-17-007-959
Prepared in cooperation with Maryland Univ., Baltimore. School of Medicine.
Pub. in Proceedings of the Society for Experimental Biology and Medicine, v138 n3 p759-762 Dec 71.

Descriptors: (*Coelenterata, *Toxins and antitoxins), Venoms, Toxicity, Bites and stings, Physiology, Enzymes, Antigens, Electrophoresis.
Identifiers: Sea nettles, Jellyfish, Chrysaora quinquecirrha, Nematocysts, Immunoelectrophoresis.

Isoelectric focusing was applied to separate and define the active components of the toxin of the sea nettle, Chrysaora quinquecirrha.

N72-28051 PC$3.75/MF$0.95
Aerospace Medical Research Labs., Wright-patterson AFB, Ohio.
CONTINUOUS ANIMAL EXPOSURE TO DICHLOROMETHANE.
J. D. Macewen, E. H. Vernot, and C. C. Haun. May 72, 31p NASA-CR-127698, AMRL-TR-72-28
Contract NASA ORDER T-80498, F33615-70-C-1046

Descriptors: *Chlorides, *Methyl compounds, *Toxicity, Dogs, Monkeys, Rats, Spacecraft contamination, Toxicity and safety hazard.

For abstract, see STAR 10 19.

PB-212 517 PC$3.00/MF$0.95
Little (Arthur D.), Inc., Cambridge, Mass.

SINGLE-DOSE TOXICITY OF 3-TRITYLTHIO--L-ALANINE CLINICAL FORMULATION (NSC 83265), ADMINISTERED IN DOGS BY THE INTRAVENOUS ROUTE.
Final rept.,
Paul E. Palm, Elsie P. Arnold, Peter C. Rachwall, and Charles J. Kensler. 27 Jun 72, 87p ADL-NCI-72-39
Contract PH-43-65-61

Descriptors: (*Antineoplastic agents, Toxicity), (*Alanines, Toxicity), (*Malignant neoplasms, *Drugs), Amino acids, Organic sulfides, Bioassay, Dosage, Dose rate, Parenteral infusions, Blood circulation, Hematology, Blood chemical analysis, Kidneys, Liver, Pathology, Dogs.
Identifiers: Alanine/tritylthio.

The S-substituted cysteine derivative, 3-tritylthio-L-alanine (NSC 83265), was administered to young adult beagle dogs in a single intravenous dose of 25, 50, 100 or 200 mg/kg. Death occurred only at the highest dose level but was delayed in the female, occurring Day 4. Marked toxic signs were noted in the dogs given 100 mb/kg: emesis, incontinence, lethargy and semi-responsiveness. At the lower dose levels signs of toxicity were generally minimal. At dose levels > or = 100 mg/kg the drug was leukotoxic and produced some kidney involvement indicated by elevated BUN levels. Liver damage, manifested by very markedly elevated SGPT, SGOT and alkaline phosphatase levels, was observed at doses of 50 mg/kg and higher. This liver damage appeared to be readily reversible as liver micropathology was minimal except in the female sacrificed one week after a dose of 100 mg/kg. On the basis of these findings the highest non-toxic dose of NSC 83265 was about 25 mg/kg.

PB-212 608 PC$3.00/MF$0.95
Coordinating Research Council, Inc., New York.
THE EFFECTS OF CHRONIC EXPOSURE TO LOW LEVELS OF CARBON MONOXIDE ON THE CARDIOVASCULAR SYSTEM OF DOGS. II. EXPOSURE TO 50 AND 150 PPM CARBON MONOXIDE.
Final rept.,
Domenic A. DeBias, Newton C. Birkhead, Chandra M. Banerjee, and M. H. F. Friedman.
Dec 71, 78p CRC-APRAC-CAPM-4-68-2

Descriptors: (*Carbon monoxide, *Toxicology), (*Cardiovascular system, Carbon monoxide), Hematopoietic system, Hematology, Pathology, Enzymes, Dosage, Electrocardiography, Bioassay, Dogs.
Identifiers: Carbonylhemoglobin.

A study of the effects due to chronic exposure to low levels of carbon monoxide on the cardiovascular and hematologic systems of dogs continued for the second year. In the previous report, the data were derived from animals exposed to 100 ppm carbon monoxide. The present report covers the study through exposures of 150 ppm and 50 ppm and is intended as a supplement to the previous report. Since no untoward effects were noted in dogs exposed to 100 ppm carbon monoxide for fourteen weeks, a higher level of carbon monoxide, namely 150 ppm, was used to determine if some of the effects usually attributed to carbon monoxide could be observed. In addition, other animals were exposed to 50 ppm carbon monoxide and vigorously exercised to increase the work load on the cardiovascular system.

PB-212 617 PC$3.00/MF$0.95
National Bureau of Standards, Washington, D.C.
THE NATURE OF THE LEAD PAINT POISONING HAZARD,
Judith Gilsinn, Barry Nocks, and Elizabeth Clark.
2 Nov 71, 22p* NBS-10499

Descriptors: (*Lead poisoning, *Paints), (*Public health, Lead poisoning), Toxic diseases, Children, Hazards, Ingestion (Biology), Environmental surveys, Demography, Distribution (Property), United States, Bibliographies.

The report describes the nature and extent of the lead paint poisoning problem in the United States as described in current literature and in conversations with recognized experts. The report contains (1) a description of the disease, (2) a report on the geographical extent, (3) a list of the environmental factors associated with lead poisoning, and (4) a description of the characteristics of the population most susceptible to lead poisoning. (A bibliography of 56 references is included).

7. CHEMISTRY

7A. Chemical Engineering

AD-750 927 PC$3.25/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
ADVANCES IN THE DEVELOPMENT OF CONTINUOUS PROCESSES DURING ADDITIVE PRODUCTION,
I. N. Kamezov, K. N. Irydueva, Kh. S. Agadyazov, V. M. Pulatova, and D. G. Gasanov. 1 Sep 72, 25p Rept no. FTD-HC-23-1124-72
Edited trans. of mono. K Voprosu Proizvodstva Masel i Prisadok v Azerbaidzhane (Question of Oil-Additive Production) Baku, 1970 p111-142.

Descriptors: (*Lubricant additives, *Organic phosphorus compounds), Chemical engineering, Synthesis (Chemistry), Organic sulfur compounds, Phenols, Catalysts, Condensation reactions, Salts, Barium compounds, Production, Alkylation, USSR.
Identifiers: Thermal cracking, Cracking process, *Phosphorodithioates, Translations.

Continuous processes were developed for treating SCl2 with thermal cracking kerosine components to prepare bis (chloroalkyl) sulfide intermediates and for alkylation of PHOH by polymer distillates in the presence of an aluminosilicate catalyst. The resulting alkylphenols were condensed with HCHO, and optionally, the condensation product was treated with P2S5 to form dithiophosphate diesters. Either product was neutralized by Ba (OH)2 or CaO to produce the lubricating oil additives AzNII-7 an BFK, respectively. (Author)

AD-750 946 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
PREPARATION OF LUBRICATING OILS BY THE ALPHA-OLEFIN ALKYLATION OF HEAVY GAS OIL FROM CATALYTIC CRACKING,
B. A. Sadykhova, R. Sh. Kuliev, R. Z. Gasanova, and N. S. Pudnitskaya. 21 Jul 72, 9p Rept no. FTD-HT-23-904-72
Edited trans. from Azerbaidzhanskoe Neftyanoe Khozyaistvo (USSR) n9 p38-39 1970, by Rene E. Courville.

Descriptors: (*Oils, Production), (*Alkenes, *Alkylation), Synthesis (Chemistry), Catalysts, Petroleum, Temperature, USSR.
Identifiers: Lubricating oils, *Catalytic cracking, Petroleum refining, Translations.

The article gives the results of an investigation of the influence of different factors (temperature, ratio of reagents and contact period) on the alkylation reaction of heavy gas oil from catalytic cracking by alpha-olefins, a 30-350C fraction obtained by the pyrolysis of parafin. (Author)

AD-750 978 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE UTILIZATION OF THE WASTES OF ALLYL CHLORIDE PRODUCTION,
M. M. Guseinov, F. Sh. Akhmedov, F. F. Muganlinskii, and D. V. Mamedov. 15 Sep 72, 11p Rept no. FTD-HT-23-900-72
Edited trans. of Azerbaidzhanskoe Neftyance Neftyance Khozyaistvo (USSR) n4 p39-40 1971, by Joseph E. Pearson.

Descriptors: (*Halogenated hydrocarbons, *Chlorination), Chlorine, Air, Catalysts, Copper compounds, Fluidized bed processes, Wastes (Industrial), Temperature, USSR.
Identifiers: *Chlorine aliphatic compounds, *Waste gas recovery, Hydrogen chloride, Copper chlorides, Translations, Allyl chloride.

The present article cites results of the use of hydrogen chloride in the oxidative chlorination of the waste products from the production of allyl chloride. Oxidative chlorination of the allyl chloride byproduct mixture containing 1-chloropropane (0.4), propene (0.7), allyl chloride (30.0), 2-chloropropene (64.6), 1-chloropropene (2.0) and 2-chloropropane (2.5% by wt.) was carried out with a mixture of Cl2 and air (from decomposing HCl gas), in the presence of a fluidized bed catalyst consisting of CuCl2 (5 to 20% by wt.) on pumice. The optimal conditions for the process were determined.

N72-28491 PC$3.00/MF$0.95
National Lending Library for Science and Technology, Boston Spa (England).
EXPERIMENTAL INDUSTRIAL INVESTIGATIONS ON THE MANUFACTURE OF PIGMENTARY TITANIUM DIOXIDE BY BURNING TITANIUM TETRACHLORIDE IN THE JET OF A HYDROGEN FLAME.
N. V. Galitskii, A. V. Kondratenko, G. N. Lebedev, V. I. Vatamanyuk, and L. V. Pisarev.
May 72, 14p NLL-RTS-7157
Tran- Transl. Into English From Sb. Tr. Vses. Nauch.-issled Proekt. Inst. Titana (USSR, V. 6, 1970 P 47-54

Descriptors: *Air, *Combustion, *Hydrogen, *Tetrachlorides, *Titanium oxides, Flames, High temperature research, Industries.

For abstract, see STAR 10 19.

N72-30127 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
POTASSIUM PERMANGANATE FOR MERCURY VAPOR ENVIRONMENTAL CONTROL.
D. E. Kuivinen. Sep 72, 16p NASA-TM-X-2616, E-6929

Descriptors: *Exhaust systems, *Mercury vapor, *Potassium compounds, Permanganates, Zeolites.

For abstract, see STAR 10 21.

PB-212 560 PC$6.00/MF$0.95
Shell Development Co., Emeryville, Calif.
AFTERBURNER SYSTEMS STUDY,
R. W. Rolke, R. D. Hawthorne, C. R. Garbett, E. R. Slater, and T. T. Phillips. Aug 72, 512p* S-14121 EPA-R2-72-062
Contract EPA-EHSD-71-3

Descriptors: (*Afterburners, *Air pollution control equipment), (*Catalytic converters, Afterburners), Handbooks, Flames, Decomposition, Hydrocarbons, Odors, Carbon monoxide, Particles, Flue gases, Performance evaluation, Furnaces, Heat recovery, Construction materials, Corrosion, Cost estimates, Combustion, Combustion products, Reaction kinetics.
Identifiers: *Air pollution control, *Thermal afterburners.

The results are presented of a study of afterburner or fume incinerator technology for control of gaseous combustible emissions from stationary sources. The scope of the study included evaluation of current engineering technology, evaluation of existing afterburner systems, assessment of present practices and problems, determination of major sources and potential applications, and development of research recommendations. The main results of the study are presented as a handbook, allowing the potential user to be able to decide if his particular emission is amenable to after-

burning and to obtain a rough estimate of cost and size of equipment needed. The user will also be made aware of potential problems and recommended design features. (Author)

PB-212 607 PC$3.00/MF$0.95
Southern Research Inst., Birmingham, Ala.
A STUDY OF RESISTIVITY AND CONDITIONING OF FLY ASH.
Final rept.
Feb 72, 154p* A-839-2504-13 EPA-R2-72-087
Contract CPA-70-149

Descriptors: (*Air pollution, Fly ash), (*Electrostatic precipitation, *Fly ash), Injection, Conditioning (Treating), Electrical resistance, Sulfur trioxide, Sulfuric acid, Ammonia, Cost estimates, Electric power plants, Flue gases, Particles, Combustion products.
Identifiers: *Air pollution control.

An experimental study was made of the injection of SO3 or H2SO4 gaseous conditioning agent to alleviate the problem of high electrical resistivity of fly ash. This problem interferes with the electrostatic precipitation of fly ash in power stations burning low-sulfur coals and thus providing very low concentrations of H2SO4 as a naturally occurring conditioning agent. Experimental measurements included in the study consisted of determinations of fly-ash resistivity in situ and analyses of coal, flue gases, and fly ash with injected SO3 and H2SO4 concentrations up to 50 ppm. For comparison with conditioning by injected SO3 and H2SO4, a parallel study was made of conditioning by H2SO4 as produced naturally during the burning of coal. To compare the economic aspects of different processes of SO3 and H2SO4 injection, an analysis was made of the various capital and operating costs in existing injection facilities. NH3 was studied as a means of coping with poor precipitator efficiency in a power station burning a high-sulfur coal and thus producing an undesirably high concentration of H2SO4.

PB-212 736 PC$3.00/MF$0.95
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME XVIII. PURIFICATION OF GASES THROUGH HIGH TEMPERATURE REMOVAL OF SULFUR COMPOUNDS.
1972, 144p AICE-AIR-72-18 APTD-1348
Grant EPA-R-800 878
See also Volume 16, PB-211 466.

Descriptors: (*Air pollution, *Sulfur inorganic compounds), (*Sulfur dioxide, *Chemisorption), (*Hydrogen sulfide, Chemisorption), (*Oxides, *Adsorbents), Adsorption, Flue gases, calcium oxides, Thermodynamics, Iron oxides, Manganese oxides, Electric power plants, Combustion products, Chemical engineering, Heat of activation, Limestone, Translations, USSR, Thermochemistry.
Identifiers: *Air pollution control, Dry methods.

A translation is presented of a Russian monograph which contains the results of the authors' numerous theoretical and experimental studies which deals with the removal of sulfur compounds (hydrogen sulfide and sulfur dioxide) from heated gaseous mixtures through the use of dry methods using metal oxides and without lowering the temperature of the gases. Results of performed thermodynamic and numerous experimental studies are given. Conditions of processes of high-temperature purification of gases by means of solid reagents are indicated. Prospects for the use of dry methods of removal of sulfur compounds from gases at high temperatures under conditions of combustion of sulfur fuels at steam power plants are evaluated.

7B. Inorganic Chemistry

AD-750 429 Reprint
Washington State Univ Pullman Dept of Chemistry
EXCITED STATES OF TRANSITION METAL COMPLEXES. A SPECTROSCOPIC MEASUREMENT OF ORBITAL INTERACTIONS IN IRIDIUM (III) COMPLEXES,
R. J. Watts, G. A. Crosby, and J. L. Sansregret. 12 Nov 71, 12p AFOSR-TR-72-1969
Grant AF-AFOSR-1342-68
Availability: Pub. in Inorganic Chemistry, v11 n7 p1474-1483 1972.

Descriptors: (*Iridium compounds, *Molecular orbitals), (*Complex compounds, Iridium compounds), Solvent action, Chelate compounds, Luminescence, Spectra (Visible + ultraviolet), N-heterocyclic compounds.
Identifiers: *Charge transfer spectra, Phenanthrolines, Quantum efficiency, Quantum interactions.

The effect of solvent medium on the measured lifetimes of the emitting states of several iridium (III) complexes is interpreted in terms of a model invoking d pi*-pi pi* configuration interaction. The model yields an interaction parameter, beta, whose magnitude is 280/cm as determined from measured energies and decay times of the cis-dichlorobis (5,6-dimethyl-1, 10-phenanthroline)iridium (III) ion. A quantitative scheme for classifying the emitting states of a number of iridium (III) complexes as 'charge transfer' or 'ligand localized' was developed in terms of the magnitude of beta. Preparations of several iridium (III) complexes of methyl-substituted phenanthroline and bipyridine are reported. Absorption and emission spectra, lifetimes, and photoluminescence quantum yields of the complexes at 77K are given. (Author)

AD-751 000 Reprint
Georgia Univ Athens Dept of Chemistry
POLYTERTIARY PHOSPHINES AND ARSINES. VII. ZEROVALENT PLATINUM COMPLEXES OF ARYLATED POLYTERTIARY PHOSPHINES AND ARSINES,
R. B. King, and Pramesh N. Kapoor. 18 Oct 71, 7p AFOSR-TR-72-2043
Grant AF-AFOSR-2000-71
See also report dated 1 Feb 71, AD-742 016.
Availability: Pub. in Inorganic Chemistry, v11 n7 p1524-1527 1972.

Descriptors: (*Chelate compounds, *Phosphines), (*Complex compounds, Phosphines), Platinum compounds, Arsines, Synthesis (Chemistry), Molecular structure.

Zerovalent platinum complexes of polytertiary phosphines and phosphine-arsines can be prepared by reaction of a mixture of K2PtCl4 and the ligand with sodium borohydride in aqueous ethanol. The chelating bidentate ligands (m-CH3C6H4)2PCH2CH2P (C6H5)2, (C6H5)2PCH2CH2As (C6H5)2, and cis-(C6H5)2PCH=CHP (C6H5)2 form yellow to orange derivatives of the type (bidentate)2Pt. The nonchelating ditertiary phosphines trans-(C6H5)2PCH=CHP (C6H5)2 and (C6H5)2PCCP (C6H5)2 form three-coordinate yellow (trans-(C6H5)2PCH=CHP (C6H5)2)3Pt and two-coordinate yellow ((C6H5)2PCCP (C6H5)2)2Pt, respectively. The new platinum (II) derivatives (cis- (C6H5)2PCH=CHP (C6H5)2)PtCl2 and ((trans- (C6H5)2PCH=CHP (C6H5)2)4Pt2) (PF6)4 are also described. (Author)

AD-751 013 Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
PSEUDOOCTAHEDRAL COBALT (III), NICKEL (II), AND CADMIUM (II) COMPLEXES OF LINEAR, SEXADENTATE, FLUORINATED SCHIFF BASE LIGANDS,
Sue C. Cummings, and Robert E. Sievers. 27 Jul 71, 11p Rept no. ARL-72-0143
Availability: Pub. in Inorganic Chemistry, v11 n7 p1483-1489 1972.

Descriptors: (*Chelate compounds, Chemical reactions), Imines, Amines, Halogenated hydrocarbons, Nickel compounds, Cadmium compounds, Cobalt compounds, Complex compounds, Spectra (Infrared), Spectra (Visible + ultraviolet), Mass spectrum, Molecular isomerism.
Identifiers: Propenol/diaminoethylene-bis (ethylimino-trifluoro-).

New pseudooctahedral complexes, Ni (BTAT), Ni (BHAT), Cd (BTAT), C (BTAT)X, Co (BTAT)X. and (Co (BTAT))2CoY4 where X (-) = Br (-), I (-), NO3 (-), and ClO4 (-) and Y (-) = Cl (-) and SCN (-), have been prepared from the linear Schiff base ligands bis (trifluoroacetylacetone)triethyle netetramine, abbreviated H2BTAT, and bis (hexafluoroacetylacetone)triethylenetetramine, abbreviated H2BHAT. Characterization of the complexes by elemental analyses, molecular weight, magnetic susceptibility, and conductivity measurements and by nmr, infrared, visible, and mass spectral data has shown that the reactions proceed stereospecifically with formation of only the s-cis isomer. (Author)

N72-28131 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
DISSOLVING ORES AND REFRACTORIES BY SODIUM PEROXIDE FUSION IN A VITREOUS GRAPHITE CRUCIBLE.
G. Jecko, and R. Royer. Jun 72, 8p
NASA-TT-F-14303
Contract NASW-2035
Tran- Transl. Into English From Chim. Anal. (Paris), V. 52, No. 10, 1970 P 1109-1111

Descriptors: *Chemical analysis, *Chromites, *Decomposition, *Refractories, *Sodium peroxides, Crucibles, Fusion (melting), Phase transformations.

For abstract, see STAR 10 19.

N72-29586 PC$7.75/MF$0.95
Msc White Sands Test Facility, N.Mex.
REACTION PROPAGATION TEST. EVALUATION OF THE BEHAVIOR OF NONMETALLIC MATERIALS IN HYDROGEN.
I. D. Smith. 24 Mar 72, 112p NASA-TM-X-68570, TR-196-001
Misc- Original Contains Color Illustrations

Descriptors: *Environmental tests, *Hydrogen, *Polymers, *Reaction kinetics, *Rubber, *Teflon (trademark), Electric wire, Helium, Nitrogen, Propagation (extension), Test equipment, Test facilities.

For abstract, see STAR 10 20.

PB-212 721 PC$3.00/MF$0.95
Edinger (Stanley Evan), Brooklyn, N.Y.
THE CHEMISTRY OF GYPSUM AND ITS DEHYDRATION PRODUCTS. TRANSLATED WORKS. VOLUME I.
Translations 1937-1965,
Stanley Evan Edinger. Oct 72, 104p STEED-72-3-1-1
See also report dated Aug 72, PB-211 207.

Descriptors: (*Gypsum, *Hydration), (*Calcium sulfates, Hydration), (*Gypsum cements, Hydration), Dehydration, Translations, USSR, Poland, Crystal growth, Reaction kinetics, Solid solutions.

Selected papers from the Soviet and Polish literature on the chemistry of gypsum and its dehydration products was translated into English. The top-

ics covered include the solution and solid state dehydration and rehydration of gypsum and the growth of gypsum crystals. This is the first volume in a series which will cover the international non-English language literature on various topics in gypsum chemistry. (Author)

7C. Organic Chemistry

AD-750 415 Reprint
Massachusetts Inst of Tech Cambridge Dept of Chemistry
HALOMETHYL-METAL COMPOUNDS LII. THE APPLICATION OF PHENYL (BROMODICHLOROMETHYL)MERCURY, PHENYL (DIBROMOCHLOROMETHY)MERCURY AND PHENYL (TRIBROMOMETHYL)MERCURY AS DIHALOCARBENE SOURCES AT ROOM TEMPERATURE,
Dietmar Seyferth, and Houng-Min Shih. Sep 72, 7p AFOSR-TR-72-1946
Grant AF-AFOSR-1971-70
Availability: Pub. in Organometallics in Chemical Synthesis, v1 p415-419 1972.

Descriptors: (*Metalorganic compounds, Chemical reactions), (*Cyclopropanes, Synthesis (Chemistry)), Halogenated hydrocarbons, Chlorine compounds, Bromine compounds, Mercury compounds, Alkenes.
Identifiers: *Mercury organic compounds, *Carbenes, *Insertion reactions, Methylene carbenes.

Phenyl (bromodichloromethyl)mercury, phenyl (dibromochloromethyl)mercury and phenyl (tribromomethyl)mercury transfer CCl2, ClCBr, and CBr2, respectively, to olefins at room temperature. High yields of the expected gem-dihalocyclopropanes are obtained in reaction times of 15-18 days in these clean and very easily carried out reactions. (Author)

AD-750 417 Reprint
Massachusetts Inst of Tech Cambridge Dept of Chemistry
A CONVENIENT ORGANOMERCURY METHYLENE TRANSFER SYSTEM,
Dietmar Seyferth, and Carol K. Haas. 24 Apr 72, 5p AFOSR-TR-72-1949
Grant AF-AFOSR-2204-72
Availability: Pub. in Jnl. of Organometallic Chemistry, v39 pC41-C43 1972.

Descriptors: (*Mercury compounds, Chemical reactions), (*Cyclopropanes, Synthesis (Chemistry)), Halogenated hydrocarbons, Iodine compounds, Alkenes.
Identifiers: *Carbenes, *Insertion reactions, Mercury organic compounds, Methylene carbenes, Mercury/bis (iodomethyl).

A 1:1 mixture of Hg (CH2I)2 and dibenzylmercury serves as a useful CH2 transfer system, converting olefins to cyclopropanes in good yield.

AD-750 717 PC$3.00/MF$0.95
Purdue Research Foundation Lafayette Ind
SELECTIVE REDUCTIONS VIA HYDRIDES.
Final rept. 1 Jul 66-30 Jun 72,
Herbert C. Brown. Oct 72, 31p AROD-6451:29-C
Contract DA-31-124-ARO (D)-453

Descriptors: (*Hydrides, *Oxidation-reduction reactions), (*Borohydrides, Oxidation-reduction reactions), (*Boron compounds, Chemical reactions), Stereochemistry, Alkenes, Halogenated hydrocarbons, Ketones, Alcohols.
Identifiers: Lithium aluminum hydride, Aluminum hydrides, Boron heterocyclic compounds.

The syntheses, modifications, and chemistry of sodium borohydride and lithium aluminum hydride have been investigated. Research has made it possible to prepare a wide variety of alkyl substituted borohydrides, LiR3BH. These are the most powerful and highly stereoselective reducing agents now available to organic chemists. These have been used in the total synthesis of prostaglandins. Research has opened up a detailed exploration of chloroboranes. These derivatives react rapidly with olefins to produce dialkylboron chloride in excellent yield. (Author)

AD-750 868 PC$3.00/MF$0.95
Frank J Seiler Research Lab United States Air Force Academy Colo
MASS SPECTRA OF (M) (N)FERROCENOPHANES AND (M) (N)FERROCENOPHANONES,
Sammy R. Carroll, Jack A. Winstead, J. L. Pflug, and Robert A. Gillham. Sep 72, 18p Rept no. SRL-TR-72-0016

Descriptors: (*Ferrocenes, *Mass spectrum), Polycyclic compounds, Ketones, Metalorganic compounds.
Identifiers: Ferrocene/bis (trimethylene).

A mass spectrometric study of six mono- and fourteen di-bridged ferrocenes ((m) (n)-ferrocenophanes and (m) (n)ferrocenophanones) has been made. Ten of the compounds have ketone functionality on their alkyl bridges, with the remaining molecules having completely saturated alkyl bridges. The molecular ion is the base peak in all twenty compounds. With the exception of (4)ferrocenophan-2-one, (3) (4)-1,3-ferrocenophan-2-one, and (4) (4)-1,3-ferrocenophan-2-one, the spectra show no fragment ions with relative intensities greater than 20 percent. A trend in the series indicates that bonds joining bridges to the ferrocene nucleus resist cleavage. There is evidence that fragmentation patterns attributed to bond rupture within the alkyl bridges can be affected by either conformational restraints or strain imposed by a second alkyl bridge in the molecule. (Author)

PB-212 588 PC$3.00/MF$0.95
Michigan State Univ., East Lansing. Inst. of Water Research.
POLYCHLORINATED BIPHENYLS IN COHO SALMON FROM WATERS OF LAKE MICHIGAN.
Completion rept.,
Norman C. Leeling. Sep 72, 9p W73-00270, OWRR-A-044-MICH (1)
Contract DI-14-01-0001-3222

Descriptors: (*Chlorine organic compounds, Separation), (*Water pollution, Chlorine organic compounds), Pesticides, Chromatographic analysis, DDT, Great Lakes, Chemical reactions, Oxidation.
Identifiers: Biphenyl/chloro, *DDE pesticide, Lake Michigan.

The objectives were two fold: To determine the level of polychlorinated biphenyl residues present in Coho salmon from Lake Michigan; and To chemically characterize the major individual components. Various physical and chemical methods used in attempts to separate the DDT complex, especially DDE, from polychlorinated biphenyls (PCB's) proved unsuccessful on a quantitative basis. These methods included high-speed liquid column chromatography, sulfuric and permanganate oxidation, and derivatization with tetraphenyl cyclopentadienone. (Author)

7D. Physical Chemistry

AD-750 324 PC$3.00/MF$0.95
Frankford Arsenal Philadelphia Pa
FRICTION OF POLY (N-ALKYL METHACRYLATES),
Henry Gisser, and Marco Petronio. 1972, 11p

Descriptors: (*Acrylic resins, Friction), (*Polymers, *Adsorption), (*Lubricants, Acrylic resins), Solutions, Films, Surfaces, Molecular structure, Plastic coatings, Solids.
Identifiers: Polymeric films, Polyacrylates, Solid lubricants.

It has been known for some time that low molecular weight compounds with a long hydrocarbon chain and polar end (e.g. stearic acid) reduce friction between solid surfaces, and this friction reduction is attributed to the orientation of an adsorbed layer of compound on the surface. Test were conducted to observe the effect of the alkyl chain group on the lubricating properties of polymethacrylate.

AD-750 330 PC$3.00/MF$0.95
Army Natick Labs Mass
FORMATION AND REACTIONS OF AZIDE RADICALS,
Elie M. Hayon. 1972, 13p

Descriptors: (*Azides, *Decomposition), Reaction kinetics, Thermochemistry, Photolysis, Radiation chemistry.
Identifiers: Radiolysis.

The work has, detected and observed the azide radical in condensed phase, produced by both photolytic and radiolytic reactions. In addition to the spectral absorption properties of N3, information was obtained on the chemical properties of this radical as well as on the decay kinetics. The highly exothermic reaction 2N3 (doublet Pi (g)) to N6 to 3N2 (singlet Sigma (g) (+)) is the reaction which is considered important in the decomposition of solid ionic azides. (Author)

AD-750 331 PC$3.00/MF$0.95
Office Chief of Research and Development (Army) Washington D C
MOLECULAR ORBITAL THEORY AS APPLIED TO FULVENE REACTIONS,
Robert B. Henry. 1972, 9p

Descriptors: (*Cyclopentenes, *Molecular orbitals), Chemical reactions, Acetones, Electron density.
Identifiers: *Fulvenes, Cyclopentadiene compounds, *Quantum chemistry, Electrophilic reactions, Nucleophilic reactions.

The report examines the molecular orbital treatment of fulvenes in order to demonstrate the correlation of nucleophilic and electrophilic attack on fulvene compounds with substitution predicted by HMO calculations. In particular, the base-catalyzed reaction of dimethylfulvene and acetone was studied to show how these calculations confirm the proven structure. (Author)

AD-750 343 PC$3.00/MF$0.95
Harry Diamond Labs Washington D C
A NEW EMPHASIS ON THE USE OF EXCITED--STATE G FACTORS FOR THE INTERPRETATION OF IMPURITY-ION SPECTRA,
S. M. Kulpa, and N. Karayianis. 1972, 15p

Descriptors: (*Paramagnetic resonance, Impurities), Doping, Rare earth elements, Ground state, Zeeman effect, Lasers, Atomic energy levels.
Identifiers: *Laser materials, *Electron paramagnetic resonance, Double resonance spectroscopy, Ligand fields.

It has been shown that the partial g-sum rule can be a useful tool for the interpretation of impurity-ion optical spectra. Several theoretical and experimental results have been discussed wherein the accuracy of the sum rule is illustrated. Recent optical Zeeman studies of triply-ionized neodymium and erbium have been compared with theoretical predictions. Discussion has shown how some of the difficulties of optical Zeeman spectroscopy may be circumvented through the use of special, excited-state EPR techniques. A double resonance system has been described with which experiments are presently being conducted on the new laser host, LiYF4.

AD-750 362 PC$3.00/MF$0.95
Army Materials and Mechanics Research Center Watertown Mass
CARBON FIBERS: REEXAMINATION OF THE CRITICAL LOW-TEMPERATURE (200-300C) STABILIZATION OF POLYACRYLONITRILE,
Janet S. Perkins, Robert E. Sacher, Richard J. Shuford, R. Thomas, and Stanley E. Wentworth. 1972, 15p
Presented in part at the Symposium on Chemistry of Fibers and Matrices of High Performance Composites. Part I. Fibers at the National Meeting of the American Chemical Society (161st), held at Los Angeles, Calif., on 28 Mar-2 Apr 71.

Descriptors: (*Carbon fibers, Synthesis (Chemistry)), (*Acrylonitrile polymers, Carbon fibers), Sheets, Carbon, Films, Oxidation, Thermal analysis, Chemical bonds, Spectra (Infrared), Molecular structure, Heat treatment.
Identifiers: *Carbonization, Chemical reaction mechanisms.

A carbon film from polyacrylonitrile is desired for use as a sheet-type reinforcing agent, e.g., in aircraft components such as drive shafts or spoilers where its planar isotropic properties will strengthen cut-out and joint areas. The report describes the authors' research on the production of carbon fibers from polyacrylonitrile, the most effective precursor. Knowing the chemistry will allow a rational modification of the process to permit extension of the method to polyacrylonitrile in film form, the most promising precursor for sheet carbon.

AD-750 401 PC$3.00/MF$0.95
Gte Labs Inc Waltham Mass
EXCITATION AT ELECTRODES.
Final technical rept.,
Paul O. Haugsjaa, Kenneth W. French, and Adam Heller. 30 Sep 72, 20p
Contract N00014-71-C-0008
See also report dated 1 Aug 71, AD-729 058.

Descriptors: (*Electrodes, Electroluminescence), (*Electroluminescence, *Rare earth compounds), (*Electrochemistry, Electroluminescence), Terbium, Solutions, Solvents, Phosphorus compounds, Oxychlorides, Excitation, Electrical double layer, Surfaces, Ions.
Identifiers: *Phosphoryl chloride, Surface chemistry.

Electronic excitation of ions in electrode reactions has been observed. Rare earth ions in solutions of phosphorus oxychloride are excited and luminescence with emission characteristic of their photoluminescence in the same solution. The emission is observed at the surface of the negative electrode. Its characteristics are best explained by a model whereby ions approaching the region of the Helmholtz double layer surrounding the electrode are excited by electrons injected into the ionic layer. The electrons which have left the high potential energy regions of the electrode interact in a region of considerably lower potential energy, allowing the excess energy to be used to excite approaching ions. With the use of this model, the ion distribution in the vicinity of the electrode may be measured. Examples of ion density profiles are given for a Tb metal-Pr (+3)/POCl3 solution interface. (Author)

AD-750 403 PC$3.00/MF$0.95
Avco Everett Research Lab Everett Mass
NEGATIVE ION DETACHMENT.
Summary technical rept. 1 Jun 71-30 Jun 72,
A. Mandl. 30 Jun 72, 13p
Contract N00014-71-C-0386, ARPA Order-1479

Descriptors: (*Fluorine, Ions), Oxygen, Atoms, Ozone, Reaction kinetics, Halogenated hydrocarbons.
Identifiers: Fluorine atoms, Electron detachment, Oxygen atoms, Methylene/difluoro.

The authors have measured several associative detachment rates of F (-) negative ions by various gases. These reactions involved F (-) and F,O2, O, and CF2. Results are discussed.

AD-750 416 Reprint
California Univ San Diego La Jolla Dept of Chemistry
SIGMA-PI CONJUGATION: OCCURRENCE AND MAGNITUDE,
Teddy G. Traylor, Harvey J. Berwin, Josko Jerkunica, and Michael L. Hall. 1972, 12p AFOSR-TR-72-1947
Grant AF-AFOSR-1639-69
Availability: Pub. in Pure and Applied Chemistry, v30 p599-606 1972.

Descriptors: (*Metalorganic compounds, *Chemical bonds), Molecular orbitals, Germanium compounds, Tin compounds, Lead compounds, Mercury compounds, Theory, Aromatic compounds.
Identifiers: Charge transfer spectra, Hyperconjugation.

Charge-transfer spectra of aryl-CR2-Metal (X)n systems have been used to study the nature and extent of C-Metal hyperconjugation. Effects of changes in X, changes in R, and changes of the metal (C, Si, Ge, Sn, Pb, Hg, B, etc.) on the extent of Sigma-pi conjugation as well as effects of rotation about the aryl-C bond have been determined. The dependence of sigma-pi conjugation upon electron deficiency is discussed and a general theory for the extent of hyperconjugation is presented. (Author)

AD-750 419 Reprint
Stanford Univ Calif Dept of Chemistry
DEPOLARIZED RAYLEIGH SCATTERING AND THE MEAN-SQUARED OPTICAL ANISTROPHIES OF N-ALKANES IN SOLUTION,
P. J. Flory, and G. D. Patterson. 3 Feb 72, 15p
AFOSR-TR-72-1966
Grant AF-AFOSR-1960-71
Sponsored in part by National Science Foundation, Washington, D. C.
Availability: Pub. in Jnl. of the Chemical Society, Faraday Transactions II, v68 p1098-1110 1972.

Descriptors: (*Alkanes, *Rayleigh scattering), (*Solutions, Alkanes), Optical properties, Organic solvents, Polarization, Anisotropy.

A procedure has been developed whereby the mean-squared optical anisotropy (gamma square) associated with isolated solute molecules can be obtained from measurements of the depolarized Rayleigh scattering by their solutions in optically isotropic and geometrically symmetric solvents. Depolarized Rayleigh ratios R (HV) for light scattered at an angle of 90 deg by carbon tetrachloride solutions of 7 n-alkanes from C5 to C22 have been measured using a He-Ne laser (632.8 nm) as the light source. Intensity due to Raman scattering was eliminated by a narrow bandpass filter of 3 nm width. The scattered intensity due to collision induced anisotropy was estimated. The dependence of (gamma square) on chain length is well reproduced by calculations carried out using the valence optical scheme and rotational isomeric state theory.

AD-750 420 Reprint
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
ELECTRON SPIN EXCHANGE IN ATOMIC COLLISIONS,
Gary M. Carter, and David E. Pritchard. 15 Oct 71, 12p
Contract DAAB07-71-C-0300
Availability: Pub. in Physical Review A, v5 n3 p1225-1236 Mar 72.

Descriptors: (*Atoms, Interactions), Spin, Electrons, Scattering, Molecular energy levels.
Identifiers: *Electron spin, Spin exchange scattering, Exchange interactions.

The authors consider electron spin-exchange collisions between an atom with an electron spin of 1/2 and a target atom with an arbitrary electron spin. The cross sections that describe the collision are expressed in terms of generalized direct and exchange amplitudes and are shown to depend only on the electron spin, polarization, and alignment of the target atom. Included are the effects of an external magnetic field and the nuclear spin of the spin-1/2 atom on the collision. They calculate the cross sections connecting the initial and final states of the free Hamiltonian describing the spin-1/2 atom, with analytic results being displayed for the two limiting cases of the external magnetic field. For the general case, graphical results are presented for several common values of nuclear spin that allow the cross sections to be evaluated for arbitrary magnetic fields. The results are applied to several situations of current interest. (Author)

AD-750 423 PC$3.00/MF$0.95
Rocket Propulsion Establishment Westcott (England)
THE HETEROGENEOUS DECOMPOSITION OF HYDRAZINE: PART 5. THE KINETICS OF THE DECOMPOSITION OF LIQUID HYDRAZINE ON A SUPPORTED RUTHENIUM CATALYST.
Technical rept.,
C. F. Sayer. Jan 72, 27p Rept no. RPE-TR-72/1
DRIC-BR-29320
See also report dated Dec 69, AD-710 627.

Descriptors: (*Hydrazine, *Decomposition), Liquefied gases, Catalysts, Ruthenium, Reaction kinetics, Adsorption, Great Britain.
Identifiers: Chemical reaction mechanisms, Shell 405 catalyst.

The heterogeneous decomposition of liquid hydrazine on a supported ruthenium catalyst is a complex reaction. The kinetics have been analysed in terms of two simultaneous reactions: 3N2H4 to N2 + 4NH3 and 2N2H4 to N2 + H2 + 2NH3. Both reactions are first order with respect to hydrazine concentration. It is suggested that the first reaction occurs when hydrazine is associatively adsorbed on the catalyst but that when it is dissociatively adsorbed the second reaction occurs.

AD-750 434 Reprint
Utah Univ Salt Lake City Dept of Physics
ACCURATE CALCULATION OF FOURIER TRANSFORM OF TWO-CENTER SLATER ORBITAL PRODUCTS,
Hendrik J. Monkhorst, and Frank E. Harris. 1 Jul 71, 8p AFOSR-TR-72-1984
Grant AF-AFOSR-1992-71
Availability: Pub. in International Journal of Quantum Chemistry, v6 p601-607 1972.

Descriptors: (*Molecular orbitals, Integral transforms), Band theory of solids, Fourier analysis.
Identifiers: *Quantum chemistry, Fourier transformation, Computer aided analysis.

A method is presented which leads to accurate Fourier transform values of any ls-ls Slater-type orbital overlap distribution. The numerical merits are discussed and illustrated by some examples. (Author)

AD-750 438 Reprint
Stanford Univ Calif Dept of Chemistry
OPTICAL ANISOTROPIES OF POLYOXYETHYLENE OLIGOMERS,
G. D. Patterson, and P. J. Flory. 3 Feb 72, 7p
AFOSR-TR-72-1967
Grant AF-AFOSR-1960-71
Availability: Pub. in Jnl. of the Chemical Society, v68 p1111-1116 1972.

Descriptors: (*Solutions, Polymers), (*Polymers, *Rayleigh scattering), Anisotropy, Polarization, Optical properties, Chemical bonds, Molecular isomerism.

Identifiers: Rotation (Chemical bonds), Polyoxyethylene.

The mean-squared optical anisotropies (gamma squared) of four oligomers of polyoxyethylene glycol dimethyl ether have been determined from measurements of depolarized Rayleigh scattering by carbon tetrachloride solutions at 25C. They have been interpreted using the valence optical scheme and rotational isomeric state theory. The energies of the gauche states relative to trans were taken to be 900 cal/mol-and -250 cal/mol for rotations about C-O and C-C bonds respectively. Bond optical anisotropies were assigned.

AD-750 439 Reprint
California Univ Los Angeles Dept of Chemistry
THE CRYSTAL AND MOLECULAR STRUCTURE OF 5-KETO-1,5-DIHYDROBENZ (CD)INDOLE,
Mary Burke Laing, K. N. Trueblood, and R. A. Sparks. 10 Dec 71, 8p Rept no. Contrib-1727 AFOSR-TR-72-1968
Contract AF 49 (638)-719
Availability: Pub. in Acta Crystallographica, vB28 pt6 p1920-1926 Jun 72.

Descriptors: (*Indoles, *Crystal structure), (*Molecular structure, Indoles), X-ray diffraction analysis, Chemical bonds, Molecular association, Polycyclic compounds.
Identifiers: Benzindolone/dihydro, Hydrogen bonds.

5-Keto-1,5-dihydrobenz (cd)indole, C11H7NO, forms monoclinic needles, space group P2 (1)/c, and four molecules in the unit cell. Intensity data were collected photographically. The structure was solved with the help of a Patterson projection and a molecular search program, and was refined by least-squares methods to R=0071. The bond distances indicate that the molecule exists predominantly in the quinonoid form, in agreement with other chemical evidence. The strain induced by the exocyclic bridge distorts the molecule and buckles it slightly, the angle between the normals to the planes of the fused six-membered rings. The molecules are packed in herringbone fashion and are linked in infinite chains by N-H...O hydrogen bonds parallel to c. The molecular motion in the crystal is small. (Author)

AD-750 440 Reprint
Rochester Univ N Y Dept of Physics and Astronomy
ENERGY FLOW FROM AN ATOMIC DIPOLE IN CLASSICAL ELECTRODYNAMICS,
L. Mandel. 9 Mar 72, 5p AFOSR-TR-72-2017
Contract F44620-69-C-0086
Availability: Pub. in Jnl. Optical Society of America, v62 n8 p1011-1012 Aug 72.

Descriptors: (*Atomic energy levels, Dipole moments), Electron transitions, Relaxation time, Electromagnetic fields.
Identifiers: Electrodynamics, *Spontaneous emission, *Two level atoms, Superradiance.

It is shown that the exponential decay and the lifetime of an oscillating atomic dipole can be accounted for by simple classical considerations of the electromagnetic energy flow in the near field, without explicit introductin of radiation reaction. It was found that the dipole gives up its energy of excitation very rapidly to the near field, from which it flows slowly into the far field. (Author)

AD-750 449 Reprint
Stanford Research Inst Menlo Park Calif
SEMIEMPIRICAL CALCULATIONS OF THE HE* (2 TRIPLET S AND 2 SINGLET S) + AR IONIZATION TOTAL CROSS SECTIONS.
Technical rept.,
Ronald E. Olson. 13 Mar 72, 9p Rept no. TR-3
Contract N00014-70-C-0339
Report on Inelastic Collisions of Excited Atoms.
Availability: Pub. in Physical Review A, v6 n3 p1031-1036 Sep 72.

Descriptors: (*Helium, Interactions), (*Argon, *Gas ionization), Excitation, Differential cross section, Potential energy, Inelastic scattering.
Identifiers: *Penning effect, Atom atom interactions, Ionization cross sections, *Collisional energy transfer, Collison cross sections.

The ionization (associative and Penning) total cross sections for He* (2 triplet S) + Ar and He* (2 singlet S) + Ar have been calculated from 0.001 to 10,000 eV and compared with experimental data. The classical calculations used interaction potentials that agreed with ab initio theoretical calculations for the repulsive wall, possessed the correct long-range energy dependence, and were in agreement with glory-scattering experiments. It was found that as the collision energy increased at the very low energies, the cross sections decreased until about 0.1 eV where they began slowly to rise. The cross sections predicted by the high-energy results, 100-1500 eV, are compared with the data of Moseley, Peterson, Lorents, and Hollstein and are found to agree within 20% and to have a similar energy dependence.

AD-750 458 Reprint
Stanford Research Inst Menlo Park Calif
DEEXCITATION OF FAST HE, NE, AND AR METASTABLE ATOMS IN VARIOUS GASES.
Technical rept.,
James R. Peterson , John T. Moseley, D. C. Lorents, and M. Hollstein. 13 Mar 72, 10p Rept no. TR-4
Contract N00014-70-C-0339
Sponsored in part by Advanced Research Projects Agency through the Army Research Office (Durham). See also report dated 13 Mar 72, AD-750 449. Report on Inelastic Collisions of Excited Atoms.
Availability: Pub. in Physical Review A, v6 n3 p1025-1031 Sep 72.

Descriptors: (*Helium, Relaxation time), Excitation, Differential cross section, Interactions, Nitrogen, Argon, Alkynes, Inelastic scattering.
Identifiers: Penning effect, Acetylene, Atom atom interactions, Atom molecule interactions, *Collisional energy transfer, Collision cross sections.

Absolute cross sections for the deexcitation of He (2 singlet S) and of He (2 triplet S) metastables by N2 and Ar were measured over the energy interval from 150 to 1600 eV using an optical technique. The 2 singlet S cross sections were found to be as much as 50% larger than the 2 triplet S cross sections for deexcitation by N2, while for Ar the two cross sections were nearly equal at these energies. Deexcitation cross sections were also measured by collecting slow ions for mixed beams of He metastables in N2, Ar, and C2H2 and for mixed beams of Ar metastables in C2H2 and Ne metastables in Ar. These measurements are in the energy range from 50 to 600 eV. They do not discriminate between different metastable states, but the results exhibit an energy behavior similar to that of the state-separated measurements and are consistent with those measurements when comparison can be made. (Author)

AD-750 464 PC$3.00/MF$0.95
Arnold Engineering Development Center Arnold Air Force Station Tenn
COLLISIONAL DE-EXCITATION CROSS-SECTION MEASUREMENT OF ELECTRONIC STATES OF ATOMIC AND MOLECULAR HYDROGEN BY COLLISION WITH MOLECULAR HYDROGEN.
Final rept. 1 Jul 71-1 Mar 72,
J. W. L. Lewis, and W. D. Williams. Oct 72, 40p Rept no. AEDC-TR-72-132
Contract F40600-72-C-0003
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn. Rept. no. ARO-VKF-TR-72-89.

Descriptors: (*Hydrogen, Electron transitions), Excitation, Line spectrum, Atoms, Atomic spectroscopy, Differential cross section, Atomic energy levels, Relaxation time, Interactions.
Identifiers: Deexcitation, Balmerseries, Hydrogen atoms, Atom molecule interactions, *Collisional energy transfer, Collision cross sections.

The H (alpha), H (beta), and H (gamma) lines of the Balmer series of atomic hydrogen and the G singlet Sigma (g) (+) to B singlet Sigma (u) (+) molecular hydrogen system were produced by 40-kev electron beam excitation of molecular hydrogen at room temperature. The collisional deexcitation cross section of the above-mentioned excited electronic states in collision with H2 X singlet Sigma (g) (+) was measured. (Author)

AD-750 470 PC$3.00/MF$0.95
Instituto Nacional de Tecnica Aeroespacial Madrid (Spain)
ASYMPTOTIC ANALYSIS OF DIFFUSION AND SIMULTANEOUS MULTIPLE-STEP CHEMICAL REACTIONS,
Amable Linan. Aug 69, 8p AFOSR-TR-72-1978
Grant EOOAR-68-0031

Descriptors: (*Reaction kinetics, *Diffusion), Flames, Perturbation theory, Gas flow, Spain, Atmospheric sounding.
Identifiers: Gaseous diffusion, Chemical release studies, Diffusion theory.

The purpose of the paper is to show how perturbation methods may be used to obtain asymptotic solutions of the equations describing the combined process of diffusion and multiple-step chemical reactions. As an example, the diffusional kinetics of high altitude chemical releases are analyzed. (Author)

AD-750 480 PC$3.00/MF$0.95
New Mexico State Univ University Park
STUDY OF BASIC PHYSICAL MECHANISMS OF TUNABLE INFRARED LASERS (LASER EXCITED EMISSION FROM SELECTED ORGANIC LIQUIDS).
Final rept. 1 Jan 70-31 Dec 71,
Jerald R. Izatt. Mar 72, 75p AFCRL-72-0169
Contract F19628-70-C-0154

Descriptors: (*Cyclopentanes, *Spectra (Infrared)), (*Fluorescence, Cyclopentanes), Irasers, Carbon dioxide, Resonance absorption, Electron transitions, Laboratory equipment, Molecular energy levels.
Identifiers: *Laser induced fluorescence, *Tunable lasers, Carbon dioxide lasers, Molecular vibration.

The 8-15 micron emission spectra of several liquid cyclopentane derivatives have been measured. The samples, all of which have strong absorption bands near 10.6 microns, were excited with a CW CO2 laser operating at a power level of a few watts. Phase-sensitive detection was employed, and both spectral and temporal discrimination were used to distinguish between the thermal and fluorescence components of the radiation emitted by the samples. Early steps have been made toward the development of a theoretical model for calculating the vibration spectra of mono-substituted cyclopentane derivatives. A discussion is given of possible applications of these and other organic liquids to the development of a continuously tunable infrared laser and the generation of ultra-short infrared laser pulses.

AD-750 494 PC$3.00/MF$0.95
Georgia Inst of Tech Atlanta School of Physics
THE MOBILITY, DIFFUSION, AND CLUSTERING OF K (+) IONS IN GASES.
Technical rept.,
G. M. Thomson, J. H. Schummers, D. R. James, E. Graham, and I. R. Gatland. 15 Sep 72, 38p AFOSR-TR-72-2003
Grant AF-AFOSR-2097-71

Descriptors: (*Potassium, Ions), (*Ions, *Diffusion), Mass spectroscopy, Interactions, Mathematical analysis, Molecular association, Diatomic molecules.
Identifiers: *Drift tube mass spectroscopy, Clumps, Gaseous diffusion, *Ion molecule interactions, Diffusion coefficient.

The authors have measured, with a drift tube mass spectrometer, the mobilities and longitudinal diffusion coefficients of K (+) ions in nitrogen and carbon monoxide at 300K. The zero-field reduced mobilities of K (+) ions in N2 and CO were determined. The experimental diffusion coefficients were compared with the predictions of an equation developed by Wannier on the assumption that the ion-molecule interaction consists of only the attractive polarization force. Comparison is also made with a modified version of this equation which contains the ionic drift velocity rather than the mean free time. Also observed was the clustering of single molecules of CO2, NO, CO, N2, O2, Ar, D2, Ne, and He to K (+) ions.

AD-750 529 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
EQUIPMENT FOR DETERMINING THE DISCRETE ENERGY LEVELS OF ATOMS IN GASES,
L. I. Saifullin, and A. I. Andrushko. 8 Sep 72, 8p
Rept no. FTD-HT-23-955-72
Edited trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Fiziki (USSR) v14 n1 p152-153 1971, by Henry Peck.

Descriptors: (*Atomic energy levels, Measurement), Ionization potentials, Excitation, Laboratory equipment. Gas ionization, Ions, USSR.
Identifiers: Translations.

A laboratory apparatus is described which enables the direct confirmation of the existence of discrete energy levels in atoms and makes it possible to determine excitation and ionization potentials. (Author)

AD-750 647 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THEORY OF THE INFRARED ABSORPTION SPECTRUM OF A COF2 SINGLE CRYSTAL,
V. I. Peresada, and E. S. Syrkin. 21 Jul 72, 9p Rept no. FTD-HT-23-324-72
Edited trans. of Spektroskoriya Kristallov. Materialy II Simpoziuma, 1967 (Crystal Spectroscory. Material from the Second Symposium, 1967), Moscow, 1970 p88-90 (sic), by John A. Miller.

Descriptors: (*Cobalt compounds, Infrared spectroscopy), Fluorides, Band theory of solids, Absorption spectrum, Atomic energy levels, USSR.
Identifiers: Translations, *Cobalt fluorides.

The infrared absorption spectra of Co (2+) ions in a CoF2 crystal lattice is established and the point charge method is used to evaluate field parameters.

AD-750 656 PC$3.00/MF$0.95
Cornell Univ Ithaca N Y Lab of Plasma Studies
SCALING ANALYSIS OF EXPERIMENTAL STRIPPING CROSS SECTIONS FOR ADIABATIC COLLISIONS OF HEAVY ATOMS.
Topical research rept.,
Hans H. Fleischmann, and R. Ch. Dehmel. Apr 71, 11p Rept no. LPS-71
Contract N00014-67-A-0077-0002, Grant NSF-GP-9501
Presented at the International Conference on the Physics of Atomic and Electronic Collisions (7th), held at Amsterdam (Netherlands) on 26-31 Jul 71.

Descriptors: (*Gas ionization, Atoms), Interactions, Perturbation theory.
Identifiers: *Atom atom interactions, Electron stripping, Adiabatic conditions.

Comparison of a wide range of experimental stripping cross sections for atom-atom collisions with Firsov's statistical theory exhibits marked disagreement in a number of cases. A few scaling law more suitable for single-electron transitions is derived which provides a better description for these reactions. Also cross sections for stripping of ions fit well into this new scheme. (Author)

AD-750 659 PC$3.00/MF$0.95
Cornell Univ Ithaca N Y Lab of Plasma Studies
DIRECT TRANSITION FEATURES IN STRIPPING COLLISIONS OF HEAVY NEUTRAL ATOMS AND IONS.
Topical research rept.,
Hans H. Fleischmann, Rh. C. Dehmel, and S. K. Lee. Jul 71, 47p Rept no. LPS-78
Contract N00014-67-A-0077-0002, Grant NSF-GP-9501

Descriptors: (*Gas ionization, Atoms), Interactions, Theory, Mathematical analysis, Differential cross section.
Identifiers: Electron stripping, *Atom atom interactions, *Atom ion interactions, Collision cross sections.

Previously published experimental data on single-electrons tripping for over 100 different neutral-neutral and almost 100 ion-neutral collision pairs are compared with Firsov's statistical ionization model. Reasonable agreement is found for a number of reactions, in particular for collisions between some rare gas atoms. However, marked disagreement exists for many other collisions. From a model assuming a single-step transition of the ionized electron from the bound state into the continuum, a scaling law is developed semi-empirically which is found able to reduce a large majority of these published data to within a factor 2 of a general cross section curve. (Author)

AD-750 662 PC$3.00/MF$0.95
Cornell Univ Ithaca N Y Lab of Plasma Studies
NEGATIVE-CHARGE PRODUCTION BY SLOW HYDROGEN ATOMS IN AR, KR, XE, CO, CO2, AND CH4.
Topical research rept.,
R. Ch. Dehmel, R. Meger, Hans H. Fleischmann, and M. Steinberg. Dec 71, 20p Rept no. LPS-86
Contract N00014-67-A-0077-0002, Grant NSF-GP-9501

Descriptors: (*Gas ionization, Atoms), Interactions, Kinetic theory, Hydrogen, Differential cross section, Carbon dioxide, Methane, Carbon monoxide, Argon, Krypton, Xenon.
Identifiers: *Atom molecule interactions, Hydrogen atoms, *Atom atom interactions, Electron stripping.

Experimental cross sections for negative-charge production by neutral hydrogen atoms in the energy range from 80 eV - 2 keV in Ar, Kr, Xe, CO, CO2, and CH4 are reported. The results agree well with earlier measurements at higher energies. (Author)

AD-750 663 PC$3.00/MF$0.95
Cornell Univ Ithaca N Y Lab of Plasma Studies
ON DRAWIN'S FORMULA FOR IONIZATION IN ATOM-ATOM COLLISIONS.
Topical research rept.,
Hans H. Fleischmann, and R. C. Dehmel. Feb 72, 18p Rept no. LPS-88
Contract N00014-67-A-0077-0002

Descriptors: (*Gas ionization, Atoms), Interactions, Molecules, Kinetic energy, Mathematical analysis, Differential cross section.
Identifiers: *Atom molecule interactions, Collision cross sections, Ionization cross sections, Drawins theorm, *Atom atom interactions.

Drawin's semiclassical formula for ionization in collisions of neutral atoms or molecules is examined. Both, from an analysis of its derivation and from a comparison with additional experimental data, it appears that considerable errors can be expected in general applications of this formula. (Author)

AD-750 704 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
ELECTROOSMOSIS OF TWO IMMISCIBLE LIQUIDS,
K. P. Tikhomolova. 28 Jul 72, 15p Rept no. FTD-MT-24-81-72
Edited machine trans. of Leningrad Univ. Vestnik (USSR) v25 n22, Seriya Fiziki i Khimii, n4 p126-132 1970, by Charles T. Ostertag, Jr.

Descriptors: (*Electroosmosis, Velocity), Mathematical analysis, Viscosity, Liquids, Oils, Water, Solubility, USSR.
Identifiers: Translations.

On the basis of formulas obtained earlier which describe the electroosmosis of two immiscible liquids in a gap capillary, the dependence of a velocity change in the process on the relationship of the viscosities of liquids was investigated. The dependence during three-layered electroosmosis was examined. The velocity of motion of water did not depend on the viscosity of oil. In the case of two-layered electroosmosis the velocities of motion depended both on the relationship of the viscosities of the liquids and on the relationship of the thicknesses of their layers. (Author)

AD-750 768 PC$3.00/MF$0.95
Polytechnic Inst of Brooklyn N Y Dept of Physics
IMPROVED CALCULATIONS OF X-RAY COHERENT AND INCOHERENT SCATTERING CROSS-SECTIONS.
Semiannual progress rept. 1 Mar-1 Sep 72,
Lawrence B. Mendelsohn. Sep 72, 21p
Contract N00014-67-A-0438-0011

Descriptors: (*Compton scattering, *Atomic orbitals), (*X rays, Compton scattering), Wave functions, Hartree-Fock approximation, Gadolinium.
Identifiers: Electromagnetic scattering, Quantum chemistry.

Progress is described in four areas of research. For large atoms a code has been developed to calculate profiles from numerical Hartree-Fock wave functions. Relativistic Compton profiles have been calculated for the first time. Non-relativistic and relativistic profile calculations for gadolinium are presented. 'Exact' hydrogenic K-shell and L-shell calculations were performed. Impulse incoherent scattering factors were shown to be greatly improved over conventional Waller-Hartree calculations for strong binding or the case of low momentum transfers. A direct variational principle to calculate coherent factors has been employed in the two-electron atom ground state isoelectronic sequence and very accurate results have been obtained using a simple trial wave function.

AD-750 771 PC$3.00/MF$0.95
General Electric Co Santa Barbara Calif DASA Information and Analysis Center
REACTION RATE DATA. NUMBER 34.
May 72, 34p
Contract DAS01-70-C-0035
Report on DNA-Sponsored Reaction Rate Research Programs. See also report dated Mar 72, AD-747 660.

Descriptors: (*Reaction kinetics, Scientific research), (*Upper atmosphere, Reaction kinetics), Atoms, Oxides, Gas ionization, Uranium, Oxygen, Ions, Differential cross section, Interactions, Plasma medium, Nitrogen oxides, Ozone, Ionosphere.
Identifiers: *Aeronomy, Atom atom interactions, Ion molecule interactions, Oxygen atoms, Ionization cross sections, Collisional energy transfer.

The issue of the DASIAC Reaction Rate Data presents summaries of recent progress reports and other informal information of current interest in the reaction rate field related to aeronomy studies.

AD-750 783 PC$3.00/MF$0.95
Princeton Univ N J
KINETICS AND MECHANISMS OF THE REACTIONS OF ATOMIC FLUORINE WITH CF3I AND CCl3BR.
Technical rept.,
Joseph Bozzelli, and Myron J. Kaufman. Sep 72, 24p Rept no. TR-5
Contract N00014-67-A-0151-0013

Descriptors: (*Halogenated hydrocarbons, *Fluorination), Bromine compounds, Chlorine compounds, Fluorine compounds, Fluorine, Atoms, Free radicals, Reaction kinetics, Mass spectroscopy.
Identifiers: Methane/iodo-trifluoro, Methane/bromo-trichloro, Fluorine atoms.

Using molecular beam analysis, the kinetics and mechanisms of the reactions of atomic fluorine with CF3I and CCl3Br have been investigated in a fast-flow reactor. Direct observation of perhalomethyl radicals and lack of detection of displaced halogen atoms proves conclusively that both of these reactions proceed primarily by abstraction, rather than displacement, of a halogen atom. In the CCl3Br system, successive 'atom-switching' reactions rapidly convert CCl3 to its fluorinated analogs. The rate constants are given. (Author)

AD-750 862 PC$3.00/MF$0.95
Aerospace Corp El Segundo Calif Lab Operations
PHOTOIONIZATION OF VIBRATIONALLY EXCITED N2: QUENCHING BY CO2 AND N2O,
Robert J. McNeal, Milo E. Whitson, and Gilbert R. Cook. 15 Sep 72, 32p SAMSO-TR-72-236
Contract F04701-72-C-0073

Descriptors: (*Nitrogen, *Quenching (Inhibition)), Reaction kinetics, Interactions, Relaxation time, Carbon dioxide, Nitrogen oxides, Afterglows, Vibration, Molecular energy levels.
Identifiers: Deexcitation, Nitrogen oxide (N2O), *Collisional energy transfer, Molecular vibration.

The rate coefficients for quenching of vibrationally excited N2 in the ground electronic state (N2*) by CO2 and N2O have been measured using a photoionization mass spectrometer to detect the N2* in a flowing N2 afterglow. The reduction in the photo-ion count rate at AMU 28 when CO2 or N2O was added to the afterglow was obtained at wavelengths longer than the photoionization threshold of ground state N2. The quenching data were analyzed with a kinetic model that includes nearly resonant transfer of vibrational energy from N2* to CO2 or N2O followed by radiative, wall, and gas-phase collisional quenching of the infrared-active gas. At low N2 partial pressures the measured quenching rate coefficient asymptotically approaches the rate coefficient for the V-V transfer reaction. (Author)

AD-750 901 Reprint
Columbia Radiation Lab New York
CASCADE RADIO-FREQUENCY SPECTROSCOPY EXCITED S AND D STATES OF RUBIDIUM; ANOMALOUS D-STATE HYPERFINE STRUCTURE,
R. Gupta, S. Chang, C. Tai, and W. Happer. 10 Jul 72, 4p
Contract DAAB07-69-C-0383, Grant AF-AFOSR-1454-68
Availability: Pub. in Physical Review Letters, v29 n11 p695-698, 11 Sep 72.

Descriptors: (*Rubidium, *Atomic energy levels), Hyperfine structure, Excitation, Fluorescence, Atoms, Polarization, Radiofrequency, Magnetic fields.

The authors report the first successful measurements by cascade rad-frequency spectrsocopy of the hyperfine structures of excited S and D states of rubidium. They obtained the magnetic dipole coupling constants (in MHz) for Rb87 and Rb85.

AD-750 903 Reprint
Columbia Radiation Lab New York
LIMITED SUPERRADIANT DAMPING OF SMALL SAMPLES,
R. Friedberg, S. R. Hartmann, and J. T. Manassah. 26 Jun 72, 2p
Contract DAAB07-69-C-0383
Prepared in cooperation with Institute for Advanced Study, Princeton, N. J., Grant AF-AFOSR-1866-70.
Availability: Pub. in Physics Letters, v40A n5 p365-366, 14 Aug 72.

Descriptors: (*Atomic energy levels, *Electron transitions), Relaxation time, Damping, Coherent radiation, Electromagnetic fields, Excitation.
Identifiers: *Superradiance, Two level atoms, Block electrons.

The authors show that for samples small compared to a wavelength the maximum possible superradiant damping is severely limited by the shortness of the radiation-field-induced relaxation time T (Delta) as compared to the superradiant lifetime T (s). (Author)

AD-750 938 PC$3.00/MF$0.95
Miami Univ Oxford Ohio Dept of Chemistry
THE DETERMINATION OF CERIUM AND GADOLINIUM IN CAF2, CDF2, AND SRF2 SINGLE CRYSTALS BY EMISSION SPECTROGRAPH.
Interim technical rept. Jun 70-Jan 72,
Larry L. Roush. Aug 72, 31p AFML-TR-72-147
Contracts F33615-72-C-1040, F33615-70-C-1021

Descriptors: (*Gadolinium, *Atomic spectroscopy), (*Cerium, Atomic spectroscopy), (*Fluorides, *Doping), Quantitative analysis, Calcium fluorides, Cadmium compounds, Strontium, Fluorides, Infrared windows, Single crystals.
Identifiers: *Spectrochemical analysis, Cadmium fluorides, Strontium fluorides.

A method is described which fills the need for quantitative determination of low concentration levels of cerium and gadolinium in fluoride-base single-crystals. The sensitivity and reproducibility attained will enable correlation of optical, electrical and energy transfer datw with observed concentration levels. A minimum of sample handling is necessary. C omplete consumption burn is used with six replicates to achieve sensitivities of 0.01% for gadolinium and 0.033% for cerium in a fluoride-graphite matrix. (Author)

AD-750 988 PC$3.75/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
EXPERIMENTAL STUDY OF THE THERMAL CONDUCTIVITY OF MONATOMIC GASES AND THEIR MIXTURES,
A. G. Shashkov, and E. I. Marchenkov. 25 Aug 72, 32p Rept no. FTD-HT-23-528-72
Edited trans. of mono. Problema Teplo- i Massoperenosa (Problem of Heat and Mass Transfer), Moscow, 1970 p297-317, by Robert D. Hill.

Descriptors: (*Gases, Thermal conductivity), (*Helium group gases, *Thermal conductivity), Mixtures, Reviews, Thermodynamics, Heat transfer, Theory, Test methods, USSR.
Identifiers: Translations.

Studies on experimental methods for thermal conductivity measurements are reviewed. A new variant of the cylindrical probe with the line heat source is discussed.

AD-751 010 Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
LEED/AUGER SPECTROSCOPY STUDY OF THE ADSORPTION OF ALKALI METALS ON MO (110),
S. Thomas, and T. W. Haas. 1972, 8p Rept no. ARL-72-0138
Availability: Pub. in Jnl. of Vacuum Science and Technology, v9 n2 p840-843 1972.

Descriptors: (*Molybdenum, *Absorption), (*Alkali metals, Adsorption), Surfaces, Crystal structure, Calibration, Gases.
Identifiers: *Low energy electron diffraction, *Auger electron spectroscopy, *Gas surface interactions.

LEED and Auger electron spectroscopy have been used to study the adsorption of Na, K, Rb, and Cs on a Mo (110) surface. Alkali ions were deposited from zeolite ion sources which enabled the absolute coverage to be measured. Peak-peak heights of Cs-47, K-251, Rb-56 and 75 eV Auger peaks and of Mo Auger lines were monitored as a function of coverage. Quantitative estimates of Na adsorption could not be made using AES owing to the low Auger yield of Na. LEED patterns showed a hexagonal close packed arrangement of the alkalis on Mo (110). (Author)

COM-72-11369 Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Aeronomy Lab.
TERMOLECULAR ASSOCIATION REACTIONS OF MG, CA, AND BA IONS,
K. G. Spears, and F. C. Fehsenfeld. 11 Feb 72, 9p
NOAA-72091607
Sponsored in part by Defense Nuclear Agency, Washington, D.C.
Pub. in Jnl. of Chemical Physics, v56 n11 p5698-5705, 1 Jun 72.

Descriptors: (*Alkaline earth metals, *Intermolecular forces), (*Ions, Intermolecular forces), Reaction kinetics, Chemical bonds, Clumps, Calcium, Barium, Magnesium, Water vapor, Nitrogen oxide (N2O), Carbon dioxide, Carbon monoxide, Oxygen, Nitrogen, Argon, Upper atmosphere.
Identifiers: Aeronomy.

The authors measured termolecular association rate constants of Mg (++), Ca (++), and Ba (++) with a variety of neutrals (Ar, O2, N2, CO, CO2, N2O, and H2O). Most neutrals associated to form all species M (++): (X)n, where n = 1, ...,6. The association rate constants of double ions are 100-500 times larger than those of single ions. There are smooth changes in rate constants for any neutral as a function of ionic radius, and a definite ordering exists between neutrals. They hypothesize that for similar ions and neutral species the rate constants for the termolecular association of neutral molecules are correlated with the ion-molecule bond strengths. With this hypothesis and data, predictions can be made for termolecular rate constants of other double ions.

COM-72-50994 PC-GPO/MF$0.95-NTIS
National Bureau of Standards, Washington, D.C. Office of Standard Reference Data.
SELECTED TABLES OF ATOMIC SPECTRA. A: ATOMIC ENERGY LEVELS - SECOND EDITION. B: MULTIPLET TABLES H I, D, T. DATA DERIVED FROM THE ANALYSES OF OPTICAL SPECTRA,
Charlotte E. Moore. Sep 72, 31p NSRDS-NBS-3-Sect-6
Library of Congress Catalog Card no. 64-60074.
Paper copy available from GPO $0.40 as stock no. 0303-0998, C13.48:3/Sec6.

Descriptors: (*Hydrogen, *Atomic spectra), (*Deuterium, Atomic spectra), (*Tritium, Atomic spectra), Tables (Data), Atomic energy levels.
Identifiers: Hydrogen atoms.

The present publication is the sixth Section of a series being prepared in response to the persistent need for a current revision of two sets of tables containing data on atomic spectra as derived from analyses of optical spectra. As in the previous sections, Part A contains the atomic energy levels and Part B the multiplet tables. The spectra of hydrogen and of the isotopes deuterium and tritium are included. (Author)

N72-28134 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CADMIUM POISONING OF OXYGEN REDUCTION ON PLATINUM ELECTRODE IN POTASSIUM HYDROXIDE.
R. O. Miller. Jul 72, 17p NASA-TM-X-2604, E-6818

Descriptors: *Cadmium, *Poisoning (reaction inhibition), *Potassium hydroxides, *Reduction (chemistry), Electrodes, Platinum, Rotating disks.

For abstract, see STAR 10 19.

N72-28135 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
RESONANCE SPECTRA OF A PARAMAGNETIC PROBE DISSOLVED IN A VISCOUS MEDIUM.
J. I. Kaplan, E. Gelerinter, and G. C. Fryburg. 1972, 7p NASA-TM-X-68111, E-7049
Conf- Presented At 4th Intern Liquid Crystal Conf., Kent, Ohio, 20-25 Aug. 1972

Descriptors: *Electron paramagnetic resonance, *Isotropic media, *Vanadyl compounds, Distribution functions, Liquid crystals, Magnetic fields, Spectrum analysis.

For abstract, see STAR 10 19.

N72-28136 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
SPECTROCHEMICAL DETERMINATION OF ULTRATRACE ELEMENTS BY THE ARGON ARC METHOD.
H. Kawaguchi, N. Higematsu, and A. Mizuike. Jul 72, 13p NASA-TT-F-14506
Contract NASW-2035
Tran- Transl. Into English From Jap. Anal. (Japan), V. 19, 1970 P 1543-1548

Descriptors: *Arc lamps, *Argon, *Spectroscopic analysis, *Trace elements, Electron density (concentration), High current, Sensitivity.

For abstract, see STAR 10 19.

N72-28139 PC$3.00/MF$0.95
National Research Council of Canada, Ottawa (Ontario).
THE ELECTROCHEMICAL POTENTIAL SERIES OF THE SULPHIDES.
W. Noddack, K. Wrabetz, and W. Herbst. 1972, 14p NRC-TT-1567
Tran- Transl. Into English From Z. Elektrochem. (Weinheim), V. 59, No. 718, 1955 P 752-755

Descriptors: *Electric potential, *Electrolytic cells, *Sulfides, Electrochemistry, Electromotive forces, Oxygen.

For abstract, see STAR 10 19.

N72-28140 PC$3.00/MF$0.95
National Research Council of Canada, Ottawa (Ontario).
THE ELECTROCHEMICAL BEHAVIOUR OF SOME HEAVY METAL SULPHIDES.
W. Noddack, and K. Wrabetz. 1972, 19p NRC-TT-1566
Tran- Transl. Into English From Z. Elektrochem. (Weinheim/Bergstr.), V. 59, No. 2, 1955 P 96-102

Descriptors: *Electrochemistry, *Sulfides, *Telluric currents, Electrodes, Electrolytic cells.

For abstract, see STAR 10 19.

N72-28141 PC$3.50/MF$0.95
Toronto Univ. (Ontario). Inst. for Aerospace Studies.
TRACE GAS ANALYSIS BY MOBILITY SEPARATION.
G. P. Laszlo. Dec 71, 29p UTIAS-TN-166

Descriptors: *Alpha particles, *Beta particles, *Gas analysis, *Mobility, One dimensional flow, Sampling.

For abstract, see STAR 10 19.

N72-28142 PC$6.75/MF$0.95
Technische Hochschule Hannover (West Germany).
CONCENTRATION AND DENSITY MEASUREMENTS ON LIQUID-LIQUID AND LIQUID-SOLID MIXTURES . KONZENTRATIONS UND DICHTEMESSUNGEN AN FLUESSIG-FEST UND FLUESSIG-FLUESSIG GEMISCHEN.
Ph.D. Thesis
J. Neumann. 1971, 91p

Descriptors: *Binary fluids, *Concentration (composition), *Density measurement, *Liquids, *Solid suspensions, Ferromagnetic materials, Magnetic measurement, Mechanical measurement, Oscillators, Particle size distribution.

For abstract, see STAR 10 19.

N72-28143 PC$4.50/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
BIBLIOGRAPHY OF PHOTOABSORPTION CROSS-SECTION DATA.
R. D. Hudson, and L. J. Kieffer. 30 Sep 70, 48p NASA-TM-X-68668, JILA-11

Descriptors: *Absorption cross sections, *Bibliographies, *Photoabsorption, Detachment, Dissociation, Ionization, Scattering.

For abstract, see STAR 10 19.

N72-28573 PC$8.50/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
GAS SURFACE INTERACTIONS OCCURRING ON MATERIALS WITHIN ULTRAHIGH VACUUM.
Ph.D. Thesis - Va. Polytechnic Inst.
R. A. Outlaw. May 72, 127p NASA-TM-X-68689

Descriptors: *Adsorption, *Borosilicate glass, *Gas-metal interactions, *Nitrogen, *Ultrahigh vacuum, Activation energy, Steels, Work functions.

For abstract, see STAR 10 19.

N72-28709 PC$3.00/MF$0.95
Rome Univ. (Italy). Inst. of Physics.
SOME PRECISE RESULTS IN STATISTICAL MECHANICS AND THEIR APPLICATION TO THE PHASE TRANSITION PHENOMENOLOGY . ALCUNI RISULTATI RIGOROSI IN MECCANICA STATISTICA E LORO APPLICAZIONI ALLA FENOMENOLOGIA DELLE TRANSIZIONI DI FASE.
G. Gallavotti. 27 Nov 71, 17p
NOTA-INTERNA-347
Conf- Presented At the Sif Congr., Laquila, Italy, 27 Oct. 1971

Descriptors: *Phase transformations, *Statistical mechanics, Boundary value problems, Particle interactions, Polarization (spin alignment).

For abstract, see STAR 10 19.

N72-28715 PC$3.00/MF$0.95
College of William and Mary, Williamsburg, Va. Dept. of Physics.
CURVE CROSSING FOR LOW ENERGY ELASTIC SCATTERING OF HE (PLUS) BY NE.
S. M. Bobbio, L. D. Doverspike, and R. L. Champion. 1972, 20p NASA-CR-127461
Contract NGL-47-006-055
Subm- Sponsored in Part By Nsf

Descriptors: *Helium ions, *Ion atom interactions, *Neon, *S matrix theory, *Scattering cross sections, Differential equations, Molecular energy levels, Schroedinger equation.

For abstract, see STAR 10 19.

N72-28716 PC$3.00/MF$0.95
Pittsburgh Univ., Pa. Space Research Coordination Center.
THE EXCITATION OF VACUUM ULTRAVIOLET RADIATION BY ELECTRON IMPACT ON CARBON MONOXIDE SOME UNRESOLVED QUESTIONS NEAR THRESHOLD.
W. C. Wells, and E. C. Zipf. Jun 72, 7p
NASA-CR-127692
Contracts NGL-39-011-030, DA-31-124-ARO (D)-440

Descriptors: *Carbon monoxide, *Electron impact, *Far ultraviolet radiation, *Molecular excitation, Photon-electron interaction, Time of flight spectrometers, Vacuum spectroscopy, Work functions.

For abstract, see STAR 10 19.

N72-28720 PC$3.00/MF$0.95
Techtran Corp., Glen Burnie, Md.
QUANTUM MECHANICAL EXPLANATION OF ACTIVATION.
F. London. Jul 72, 12p NASA-TT-F-14393
Contract NASW-2037
Tran- Transl. Into English From Z. Elektrochem. (Weinheim), V. 35, No. 9, 1929 P 552-555

Descriptors: *Activation energy, *Atomic theory, *Quantum mechanics, Chemical reactions, Nuclear binding energy, Resonance, Theoretical physics.

For abstract, see STAR 10 19.

N72-28721 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
ADSORPTION OF HYDROGEN ATOMS AND MOLECULES ON PLATINUM.
J. C. Mignolet. Jul 72, 19p NASA-TT-F-14362
Contract NASW-2035
Tran- Transl. Into English From J. Chim. Phys. (Paris), V. 54, 1957 P 19-26

Descriptors: *Adsorption, *Hydrogen atoms, *Molecules, *Platinum, *Surface properties, Gas-metal interactions, Volumetric analysis.

For abstract, see STAR 10 19.

N72-28724 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
INVESTIGATION OF LOW-Z COSTER-KRONIG TRANSITIONS BY MEANS OF AUGER AND PHOTOELECTRON SPECTROSCOPY.
L. I. Yin, T. Tsang, and I. Adler. Jun 72, 15p
NASA-TM-X-65956, X-641-72-207
Subm- Submitted for Publication

Descriptors: *Auger effect, *Photoelectrons, *Transition metals, *Zinc, Electron transitions, Emission spectra, Photoionization.

For abstract, see STAR 10 19.

N72-28917 PC-GPO/MF$0.95-NTIS
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
THERMOPHYSICAL PROPERTIES OF PARAHYDROGEN FROM THE FREEZING LIQUID LINE TO 5000 R FOR PRESSURES TO 10000 PSIA.
R. D. Mccarty, and L. A. Weber. Apr 72, 169p
NASA-CR-127701, NBS-TN-617
NASA ORDER T-1813-A, NASA ORDER W-13353
Paper copy available from GPO $1.50.

Descriptors: *Hydrogen, *Physical properties, *Thermodynamic properties, Freezing, Heat transfer, Interfacial tension, Refractivity, Tables (data).

For abstract, see STAR 10 19.

N72-29104 PC$3.25/MF$0.95
Texas Univ., Dallas.
STUDY OF EXCITATION TRANSFER IN A FLOWING HELIUM AFTERGLOW PUMPED WITH A TUNEABLE DYE LASER. 1 MEASUREMENT OF THE RATE COEFFICIENT FOR SELECTED QUENCHING REACTIONS INVOLVING HE (5 3P).
C. B. Collins, B. W. Johnson, and M. J. Shaw. 1972, 23p NASA-CR-127778, SP-72-006-1
Contract NGL-44-004-001

Descriptors: *Afterglows, *Gas lasers, *Helium, *Quenching (cooling), Energy levels, Excitation, Gas flow.

For abstract, see STAR 10 20.

N72-29299 PC$3.75/MF$0.95
Barringer Research Ltd., Rexdale (Ontario).
EXPERIMENTAL RESULTS IN THE REMOTE SENSING OF GASES FROM HIGH ALTITUDES.
A. R. Barringer, and J. H. Davies. 1972, 32p
REPT-1001244

Descriptors: *Air pollution, *Gas spectroscopy, *Remote sensors, *Trace contaminants, Earth resources, Environmental control, Multispectral band scanners, Optical emission spectroscopy.

For abstract, see STAR 10 20.

N72-29467 PC$3.75/MF$0.95
Barringer Research Ltd., Rexdale (Ontario).
RECENT PROGRESS IN THE REMOTE DETECTION OF VAPOURS AND GASEOUS POLLUTANTS.
A. J. Moffat, and A. R. Barringer. 1971, 35p
NASA-CR-127632
Subm- Sponsored in Part By Nasa

Descriptors: *Air pollution, *Gases, *Remote sensors, *Spectrometers, *Vapors, Correlation detection, Earth atmosphere, High altitude balloons, Quantitative analysis.

For abstract, see STAR 10 20.

N72-29706 PC$3.00/MF$0.95
Brown Univ., Providence, R.I.
COMPOSITION DEPENDENCE OF ION DIFFUSION COEFFICIENTS IN GAS MIXTURES AT ARBITRARY FIELD STRENGTHS.
J. H. Whealton, and E. A. Mason. 1972, 14p
NASA-CR-127784
Contract NGL-40-002-059

Descriptors: *Diffusion coefficient, *Gas composition, *Gas mixtures, *Ion distribution, *Momentum transfer, Drift rate, Ionic diffusion, Theoretical physics.

For abstract, see STAR 10 20.

N72-30124 PC$4.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
THE MECHANISM OF THE ELECTRODIFFUSION OF HYDROGEN THROUGH PALLADIUM.
N. I. Kobozev, and V. V. Monblanova. Aug 72, 39p NASA-TT-F-14368
Tran- Transl. Into English From Acta Physiochim. (USSR, V. 1, No.3-4 1934, P 611-650

Descriptors: *Electrodes, *Palladium, *Poisoning (reaction inhibition), Catalytic activity, Electrolytes, Hydrogen, Polarization characteristics.

For abstract, see STAR 10 21.

N72-30125 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
RADIONUCLIDE X-RAY FLUORESCENCE ANALYSIS. 1 EXCITATION OF X-RAY FLUORESCENSE RADIATION BY NUCLEAR RADIATION.
S. Varga. Aug 72, 20p NASA-TT-F-14510
Contract NASW-2035
Tran- Transl. Into English From Chem. Listy (Prague), V. 64, No. 12, 1970 P1253-1265

Descriptors: *Chemical analysis, *Excitation, *X ray fluorescence, Line spectra, Radiochemistry, Spectrum analysis, Wavelengths.

For abstract, see STAR 10 21.

N72-30129 PC$3.00/MF$0.95
Pittsburgh Univ., Pa. Space Research Coordination Center.
MOBILITIES OF URANIUM AND MERCURY IONS IN HELIUM.
R. Johnsen, and M. A. Biondi. Aug 72, 16p
NASA-CR-128026, APP-35
Contracts NGR-39-011-002, DA-31-124-ARO (D)-440
Subm- Submitted for Publication

Descriptors: *Mass spectrometers, *Mercury (metal), *Uranium, Drift (instrumentation), Ionic mobility.

For abstract, see STAR 10 21.

N72-30131 PC$4.75/MF$0.95
Idaho Univ., Moscow. Dept. of Mechanical Engineering.
AN EQUATION OF STATE FOR OXYGEN AND NITROGEN 2.
Quarterly Progress Report, Period Ending 1 Jan. 1972
R. B. Stewart, R. T. Jacobsen, and A. F. Myers. 1 Jan 72, 52p NASA-CR-128523
Contract NAS9-12078

Descriptors: *Equations of state, *Nitrogen, *Oxygen, Least squares method, Thermodynamic properties.

For abstract, see STAR 10 21.

N72-30132 PC$4.00/MF$0.95
Idaho Univ., Moscow. Dept. of Mechanical Engineering.
THERMODYNAMIC PROPERTIES OF OXYGEN AND NITROGEN III.
Quarterly Progress Report, Period Ending 1 Apr. 1972
R. B. Stewart, R. T. Jacobsen, and A. F. Myers. 1 Apr 72, 36p NASA-CR-128524
Contract NAS9-12078

Descriptors: *Equations of state, *Nitrogen, *Thermodynamic properties, Critical point, Oxygen.

For abstract, see STAR 10 21.

N72-30133 PC$5.00/MF$0.95
Idaho Univ., Moscow. Dept. of Mechanical Engineering.
AN EQUATION OF STATE FOR OXYGEN AND NITROGEN.
Quarterly Progress Report, Period Ending 1 Oct. 1971
R. B. Stewart, R. T. Jacobsen, and A. F. Myers. 1 Oct 71, 58p NASA-CR-128522, RR-13
Contract NAS9-12078

Descriptors: *Equations of state, *Nitrogen, *Oxygen, Density (mass/volume).

For abstract, see STAR 10 21.

N72-30391 PC$5.00/MF$0.95
Rensselaer Polytechnic Inst., Troy, N.Y. School of Engineering.
COMPARISON OF TWO GAS CHROMATOGRAPH MODELS AND ANALYSIS OF BINARY DATA.
P. S. Keba, and P. T. Woodrow. 15 Jul 72, 59p
NASA-CR-127911, RPI-MP-27
Contract NGL-33-018-091

Descriptors: *Equipment specifications, *Gas chromatography, *Structural design criteria, Binary data, Data reduction, Mathematical models, Optimization.

For abstract, see STAR 10 21.

N72-30411 PC$5.50/MF$0.95
Max-planck-institut Fuer Physik Und Astrophysik, Munich (West Germany).
MEASUREMENT OF THE PHOTOIONIZATION CROSS SECTION OF BA I IN THE SPECTRAL REGION BETWEEN 2400 AND 2100 A USING THE ATOMIC BEAM METHOD . MES SUNG DES PHOTOIONISATIONSQUERSCHNITTS VON BA I IM SPEKTRALBEREICH VON 2400-2100 A MIT EINER ATOMSTRAHLMETHODE.
H. Schulte. Mar 72, 70p
MPI-PAE/EXTRATERR-63

Descriptors: *Atomic beams, *Barium, *Ionization cross sections, *Photoionization, *Vapor pressure, Absorption spectra, Artificial clouds, Coincidence circuits, Ion production rates, Neutral particles, Particle density (concentration), Ultraviolet radiation.

For abstract, see STAR 10 21.

N72-30619 PC$3.00/MF$0.95
Texas Univ., Dallas.
STUDY OF EXCITATION TRANSFER IN FLOWING HELIUM AFTERGLOW PUMPED WITH A TUNEABLE DYE LASER. 2 MEASUREMENT OF THE RATE COEFFICIENT FOR THE ROTATIONAL RELAXATION OF HE2 (3P (3 PI G)).
C. B. Collins, and B. W. Johnson. 1972, 19p
NASA-CR-127347, SP-72-006-2
Contract NGL-44-004-001

Descriptors: *Helium afterglow, *Molecular excitation, *Molecular relaxation, *Optical pumping, Helium atoms, Lasers, Molecular collisions.

For abstract, see STAR 10 21.

N72-30620 PC$3.50/MF$0.95
Pittsburgh Univ., Pa. Dept. of Physics.
MEASUREMENTS OF RECOMBINATION OF ELECTRONS WITH H3O (PLUS)- (H2O)N SERIES IONS.
M. T. Leu, M. A. Biondi, and R. Johnsen. Jul 72, 30p NASA-CR-127820, SRCC-176

Contracts NGR-39-011-002, DA-ARO (D)-31-124-70-G34
Subm- Submitted for Publication

Descriptors: *Hydronium ions, *Mass spectrometers, *Recombination reactions, Electron density (concentration), Microwave equipment.

For abstract, see STAR 10 21.

N72-30927 PC$9.75/MF$0.95
National Physical Lab., Teddington (England). Div. of Inorganic and Metallic Structure.
A 25 KBAR PISTON-CYLINDER APPARATUS CONSTRUCTION AND OPERATING TECHNIQUES.
H. S. Turner, W. F. Wall, S. L. Thomas, and W. R. Manning. Jun 72, 153p NPL-IMS-16

Descriptors: *Chemical reactions, *Liquid phases, *Pressure vessel design, Circular cylinders, Encapsulating, High pressure, Pistons, Steels.

For abstract, see STAR 10 21.

N72-30954 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EXAMINATION OF TWO METHODS OF DESCRIBING THE THERMODYNAMIC PROPERTIES OF OXYGEN NEAR THE CRITICAL POINT.
T. H. Rees, and J. T. Suttles. Sep 72, 38p NASA-TM-X-2590, L-8418

Descriptors: *Computer programs, *Critical point, *Oxygen, *Thermodynamic properties, Data acquisition, Equations of state, Numerical analysis, Specific heat.

For abstract, see STAR 10 21.

N72-30955 PC$3.00/MF$0.95
Idaho Univ., Moscow. Dept. of Mechanical Engineering.
THE THERMODYNAMIC PROPERTIES OF OXYGEN AND NITROGEN.
Summary Report
R. B. Stewart, R. T. Jacobsen, and A. F. Myers. 31 Aug 72, 15p NASA-CR-128525
Contract NAS9-12078

Descriptors: *Equations of state, *Nitrogen, *Oxygen, *Thermodynamic properties, Data acquisition, Least squares method, Numerical analysis.

For abstract, see STAR 10 21.

N72-30956 PC$13.00/MF$0.95
Washington State Univ., Pullman. Program in Engineering Science.
THE THERMODYNAMIC PROPERTIES OF NITROGEN FROM 65 TO 2000 K WITH PRESSURES TO 10,000 ATMOSPHERES.
Ph.D. Thesis
R. T. Jacobsen. 1972, 217p NASA-CR-128526
Contract NAS9-12078
Subm- Supported in Part By Nbs. Office of Std. Reference Data and By Idaho Univ.

Descriptors: *Equations of state, *Liquefied gases, *Nitrogen, *Thermodynamic properties, Data acquisition, Least squares method, Numerical analysis.

For abstract, see STAR 10 21.

N72-30957 PC$13.75/MF$0.95
Idaho Univ., Moscow. Engineering Experiment Station.
THE THERMODYNAMIC PROPERTIES OF OXYGEN AND NITROGEN. PART 1 THERMODYNAMIC PROPERTIES OF NITROGEN FROM 115 R TO 3500 R WITH PRESSURES TO 150000 PSIA.
Final Report
R. B. Stewart, R. T. Jacobsen, and A. F. Myers. 31 Aug 72, 231p NASA-CR-128527
Contract NAS9-12078

Descriptors: *Equations of state, *High pressure, *High temperature, *Nitrogen, Density (mass/volume), Heat transfer, Least squares method, Thermodynamic properties.

For abstract, see STAR 10 21.

N72-30958 PC$10.25/MF$0.95
Idaho Univ., Moscow. Coll. of Engineering.
THE THERMODYNAMIC PROPERTIES OF OXYGEN AND NITROGEN. PART 2 THERMODYNAMIC PROPERTIES OF OXYGEN FROM 100 R TO 600 R WITH PRESSURE TO 5000 PSIA.
Final Report, Period Ending 31 Aug. 1972
R. B. Stewart, R. T. Jacobsen, and A. F. Myers. 31 Aug 72, 163p NASA-CR-128528
Contract NAS9-12078

Descriptors: *Equations of state, *High pressure, *High temperature, *Oxygen, Density (mass/volume), Heat transfer, Least squares method, Thermodynamic properties.

For abstract, see STAR 10 21.

N72-30962 PC$4.50/MF$0.95
Rome Univ. (Italy). Inst. of Physics.
FREE ENERGY NEAR THE CRITICAL POINT OF FLUIDS ACCORDING TO THE SCALING HYPOTHESIS.
E. Lentini, and M. Vicentini-missoni. 22 Mar 72, 46p NOTA-INTERNA-364

Descriptors: *Critical point, *Gibbs free energy, *Scale effect, Equations of state, Fluids, Phase transformations, Singularity (mathematics), Specific heat, Transition points.

For abstract, see STAR 10 21.

PB-212 481 PC-GPO/MF$0.95-NTIS
Bureau of Mines, Washington, D.C.
COMPRESSIBILITY DATA FOR HELIUM, NITROGEN, AND HELIUM-NITROGEN MIXTURES AT 0, 25, AND 50C AND AT PRESSURES TO 1,000 ATMOSPHERES.
Report of investigations,
Ted C. Briggs, and Alvin R. Howard. Sep 72, 200p BuMines-RI-7639
Prepared in cooperation with Helium Research Center, Amarillo, Tex. Paper copy available from GPO $2.00 as I28.23:7639.

Descriptors: (*Helium, Compressibility), (*Nitrogen, Compressibility), Mixtures, High pressure tests, Temperature, Tables (Data).

A special-pressure Burnett-type compressibility apparatus was constructed and used to determine compressibility factors for pure helium, pure nitrogen, and nine helium-nitrogen mixtures containing 89.47, 79.04, 69.69, 60.09, 49.24, 41.02, 30.99, 20.53, and 10.67 mole percent helium. A total of 161 runs were made, consisting of 2,355 observed pressures. Data were obtained at 0, 25, and 50C and at pressures to 1,000 atmospheres. A power series in the reciprocal volume (commonly called a Leiden series) is used to represent the compressibility factors. Three parameters in the series are required to represent helium, five parameters for nitrogen, and from three to five parameters for the mixtures. Compressibility factors are believed to be accurate to better than 0.1 percent over the entire pressure, temperature, and composition range. (Author)

PB-212 554 PC$3.00/MF$0.95
Dow Chemical Co., Midland, Mich. Analytical Labs.
STUDY OF AIR POLLUTANTS BY MICROWAVE SPECTROSCOPY.
Final rept.,
George F. Crable. Jun 72, 75p EPA-R2-72-093
Contract CPA-22-69-144

Descriptors: (*Air pollution, *Microwave spectroscopy), (*Gas analysis, Microwave spectroscopy), Spectrometers, Quantitative analysis, Microwave spectra, Saturation, Qualitative analysis, Performance evaluation, Ammonia, Sulfur dioxide, Formaldehyde, Nitrogen dioxide, Thiols, Acetone.
Identifiers: Carbonyl sulfide.

The results and evaluations of experiments conducted to evaluate the usefulness of microwave spectroscopy as an analytical tool for air contamination studies are discussed. The background and theory as applied to analytical applications are presented. The following three possible analytical procedures are discussed in detail: Optimum power saturation method; Line areas; and Line intensities. (Author)

PB-212 600 PC$3.00/MF$0.95
Bureau of Mines, Washington, D.C.
OXYGENATES IN AUTOMOTIVE EXHAUST GAS. ESTIMATION OF LEVELS OF CARBONYLS AND NONCARBONYLS IN EXHAUST FROM GASOLINE FUELS.
Rept. of Investigations,
D. E. Seizinger, and B. Dimitriades. 1972, 33p BuMines-RI-7675 CRC-APRAC-CAPE-11-68-6
Prepared in cooperation with Bartlesville Energy Research Center, Okla.

Descriptors: (*Exhaust gases, *Gas analysis), (*Automobile engines, Exhaust gases), (*Air pollution, Exhaust gases), Automotive fuels, Oxidizers, Gas chromatography, Aldehydes, Ketones, Alcohols, Phenols, Concentration (Composition), Gasoline.
Identifiers: *Automobile exhaust.

Analytical methods, primarily gas chromatographic, were developed for measurement of exhaust oxygenates produced from selected simple fuels. The resulting data were used to estimate levels of carbonyls and noncarbonyl oxygenates in exhaust from gasoline fuels. Estimated noncarbonyl oxygenates in gasoline exhaust may comprise as much as 30 pct of total oxygenates which include unsaturated carbonyls and noncarbonyls believed to be significant potential pollutants. (Author)

PB-212 625 PC$3.00/MF$0.95
Bendix Aerospace Systems Div., Ann Arbor, Mich.
OFF-LINE ANALYSIS PROGRAMS FOR LONG-PATH SPECTROMETER.
Final rept.,
Roger H. Hansen, and Robert H. Dye. 15 Jun 72, 57p BSR-3322 EPA-R2-72-092
Contract EPA-68-02-0249

Descriptors: (*Infrared spectrophotometers, *Computer programming), (*Ozone, Infrared spectroscopy), Programming manuals, Regression analysis, Factor analysis, Control sequences, Monitors, Spectrochemical analysis, Gas analysis, Air pollution, FORTRAN.
Identifiers: Long path infrared spectroscopy, IBM 360/50 computers, Air pollution detection.

The report documents thirteen off-line analysis programs for the long-path infrared spectrometer instrument and provides user instructions for implementing the programs on an IBM-360/50 computer. Theoretical discussion is included only to the extent necessary to permit the proper use of the programs. (Author)

7E. Radio and Radiation Chemistry

AD-750 664 PC$3.00/MF$0.95
Cornell Univ Ithaca N Y Lab of Plasma Studies

ENHANCEMENT OF CHEMICAL REACTIONS WITH TUNABLE LIGHT.
Topical research rept.,
Izaiah Nebenzahl. Mar 72, 36p Rept no. LPS-89
Contract N00014-67-A-0077-0002

Descriptors: (*Photochemistry, *Lasers), Reaction kinetics, Coherent radiation, Relaxation time, Photon bombardment, Excitation, Electromagnetic pulses, Mathematical analysis.
Identifiers: Tunable lasers, Continuous radiation, Line broadening.

The possibility of using tunable laser light to channel a chemical reaction into a direction difficult to achieve otherwise is discussed. The necessary laser powers are given in terms of the desired overall efficiency. The relative advantages of operating the lasers in pulses, compared to c.w. operation, are discussed quantitatively. A simple-minded treatment of the effects of spectral line broadening (natural, Doppler, pressure and rotational) is also given. A numerical example is worked out, to show that a two stage, two-laser process is feasible with present laser technology. (Author)

N72-29102 PC$3.50/MF$0.95
Pennsylvania State Univ., University Park. Ionosphere Research Lab.
THE REACTION OF OH WITH NO2.
R. Simonaitis, and J. Heicklen. 22 Feb 72, 26p
NASA-CR-127790, PSU-IRL-SCI-380
Contracts NGL-39-009-003, NSF GA-12385

Descriptors: *Chemical reactions, *Hydrogen, *Nitrous oxides, *Oxygen, *Photolysis, Air pollution, Carbon monoxide, Helium, Ionizing radiation, Water.

For abstract, see STAR 10 20.

N72-29103 PC$3.00/MF$0.95
Pennsylvania State Univ., University Park. Ionosphere Research Lab.
ON THE PRODUCTION OF N2O FROM THE REACTION OF O (1 D) WITH N2.
R. Simonaitis, E. Lissi, and J. Heicklen. 22 Feb 72, 16p NASA-CR-127791, PSU-IRL-SCI-389
Contracts NGL-39-009-003, NSF GA-12385

Descriptors: *Nitrous oxides, *Ozone, *Photolysis, Chemical reactions, High pressure, Ionizing radiation.

For abstract, see STAR 10 20.

PB-212 715 PC$3.00/MF$0.95
Lockheed Missiles and Space Co., Sunnyvale, Calif. Biotechnology.
STUDY OF FACTORS AFFECTING REACTIONS IN ENVIRONMENTAL CHAMBERS.
Final rept. on Phase I,
Raphael J. Jaffe. 20 May 72, 113p LMSC-A997145
CRC-APRAC-CAPA-1-69-1
Contract EPA-68-02-0038

Descriptors: (*Photochemical reactions, Test chambers), (*Air pollution, Photochemical reactions), (*Smog, *Test chambers), Design criteria, Simulators, Surface properties, Exhaust gases, Xenon lamps, Cleaning, Gas analysis, Chemical analysis, Nitrogen dioxide, Nitrogen oxide (NO), Ozone, Hydrocarbons, Aldehydes, Photolysis.

The report presents results of factors affecting environmental chambers used to study photochemical reactions in the lower atmosphere. Described are the facilities, the chamber, the light source, and some photochemical reactions. The work has shown the practicality of operating an environmental chamber externally illuminated by a collimated beam of light from an xenon arc lamp. It has also demonstrated that a vacuum chamber pump-down of the environmental chamber is a feasible method of chamber cleaning. Analytical chemistry methodology has been demonstrated for the photochemical reaction products of interest.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

AD-750 797 Not available NTIS
National Inst of Oceanography Wormley (England)
NATIONAL INSTITUTE OF OCEANOGRAPHY. COLLECTED REPRINTS. VOLUME 19.
1971, 538p
Availability: Paper copy available from National Institute of Oceanography, Wormley, Godalming, Surrey, England. Price not available.

Descriptors: (*Oceanographic data, Reports), Marine geology, Marine geophysics, Marine biology, Ocean waves, Cetacea, Plankton, Ocean currents, Sedimentation, Marine biological noise, Sea water, Sea ice, Continental shelves, Sonar, Marine engineering, Great Britain.

Contents:
- Holocene sediments on the continental shelf west of the British Isles;
- The experimental generation of double Kelvin waves;
- New computations of the tide-generating potential;
- Tidal sand movement between some linear sand banks in the North Sea off northeast Norfolk;
- Conservation of sea mammals and fish;
- Determination of the density of seawater;
- Experience with a computer in oceanographic research as sea;
- Problems of the pack ice zone;
- The use of oceanography;
- Waves how high. an analysis of sea conditions;
- Environmental conditions;
- The Canadian wave climate study;
- A measure of species diversity related to the lognormal distribution of individuals among species.

AD-750 956 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
BIOLOGICAL INVESTIGATIONS DURING THE FIRST VOYAGE OF THE SCIENTIFIC--RESEARCH VESSEL 'DMITRII MENDELEEV' IN THE WESTERN SECTION OF THE TROPICAL ATLANTIC,
N. V. Kovalevskaya, V. E. Bekker, and F. A. Pasternak. 8 Sep 72, 10p Rept no. FTD-HT-23-965-72
Edited trans. of Zoologicheskii Zhurnal (USSR) v49 n3 p478-479 1970, by R. J. Zeccola.

Descriptors: (*Marine biology, *Atlantic Ocean), Tropical regions, Ocean currents, Ocean bottom, Aquatic animals, Fishes, Sampling, USSR.
Identifiers: Translations, Biological surveys.

The new scientific research ship of The Institute of Oceanology, Academy of Sciences USSR, 'Dmitriy Mendeleyev' left of 21 February 1969 from the port Kaliningrad. The trip lasted 61 days, during which 70 stations were visted covering about 14,900 nautical miles, with one stop at Montserrat and two entries into the port of Spain (Trinidad) and Gibraltar. The main goal of the voyage was to take instrument readings of the eastward current from the ridge of the Lesser Antilles. Concurrently, biological experiments were carried out, including collection of benthic fauna, fish, and ichthyoplankton, as well as several attempts at artificial fertilization of fish roe and incubation in an aquarium. Fish collection produced about 100 different species belonging to 80 genera and 46 families. (Author)

COM-72-11327 PC$3.00/MF$0.95
Washington State Dept. of Fisheries, Olympia.
INVESTIGATION OF EFFECTS OF GRAYS HARBOR WATERS ON COHO EMIGRATION.
Completion rept. Mar 66-May 69,
Harry Senn. Jul 69, 22p NOAA-72091992
Grant NMFS-1-18-R

Descriptors: (*Salmon, *Migrations), (*Aquaculture, Washington (State)), Environmental surveys, Fisheries, Problem solving, Ecology, Statistical data, Water pollution, Marking, Sampling.
Identifiers: Oncorhynchus kisutch, *Coho salmon, *Grays Harbor (Washington).

Suspected causes of below average returns of coho salmon in 1967 to the Simpson Hatchery were low quality of reared juveniles, a water pollution problem in upper Grays Harbor, or a combination of both. Two lots of approximately 200,000 coho smolts of the 1964 brood year were given identifying fin clips. One lot was planted in the hatchery stream and the other in the Humptulips River which empties into Grays Harbor below the problem area. Sampling in the various ocean salmon troll and sport fisheries compared the contribution from the Humptulips plant to that of the Satsop plant. The experiment was repeated with the 1965 brood year to corroborate the 1964 findings.

COM-72-11331 PC$3.00/MF$0.95
Washington State Dept. of Fisheries, Olympia.
PUYALLUP HATCHERY POND AND PUMPING PLANT CONSTRUCTION.
Completion rept. Oct 70-Dec 71,
Russell K. Jones. May 72, 12p NOAA-72091991
Contract DI-14-17-001-2409

Descriptors: (*Aquaculture, *Washington (State)), (*Ponds, *Construction), Salmon, Fishways, Drainage, Rebuilding, Pumps, Distribution systems.
Identifiers: Carbon River, Puyallup salmon hatchery.

The project provided for the construction of four concrete ponds; two 1/4 acre ponds which were asphalt lined; reconstruction of the existing rack and fishway and incorporating a pump intake with them; installation of three pumps; and connecting them to distribution lines to the new ponds.

COM-72-11358 Reprint
Wisconsin Univ., Sheboygan.
DISTRIBUTION AND ABUNDANCE OF INTERTIDAL INVERTEBRATES AT OLSEN BAY IN PRINCE WILLIAM SOUND, ALASKA, ONE YEAR AFTER THE 1964 EARTHQUAKE,
Joel D. Hubbard. 1971, 22p NOAA-72082116
Sponsored in part by Bureau of Commercial Fisheries, Auke Bay, Alaska. Biological Lab. International Standard Book no. 0-309-01601-0.
Pub. in The Great Alaska Earthquake of 1964: Geology, Washington, D.C., 1971 p137-157.

Descriptors: (*Earthquakes, *Alaska), (*Invertebrates, Abundance), Beaches, Earth movements, Barnacles, Mollusca, Aquatic animals, Distribution (Property), Soils, Mortality, Coasts.
Identifiers: Prince William Sound, Uplift, Tidal flats.

Uplift associated with the 1964 Alaska earthquake has been estimated to be about 3-4 ft in the Olsen Bay area, Prince William Sound. It was found that the uplift produced measurable changes in the distribution of certain tidal organisms. The most obvious and reliable quantitative index of the uplift was provided by pre- and postearthquake limits of barnacle populations, whereas supportive evidence was obtained from study of certain bivalve mollusk distributions. Differential mortality was apparently attributable to earthquake-related processes. The distribution and abundance of intertidal macrofauna were determined by counting numbers of organisms in quadrats along established beach and tidalflat transects and in Olsen Creek. (Author)

TT-71-50130 PC$6.00/MF$0.95
National Marine Fisheries Service, Washington, D.C.
FAUNA OF THE KURILE-KAMCHATKA TRENCH AND ITS ENVIRONMENT. (BASED ON DATA OF THE 39TH CRUISE OF THE R/V 'VITYAZ') (FAUNA KURILO-KAMCHATSKOGO ZHELOBA I USLOVIYA EE SUSHCHESTVOVANIYA),
V. G. Bogorov. 1972, 579p
Trans. of Akademiya Nauk SSSR. Institut Okeanologii. Trudy, v86 537p 1970, by A. Mercado. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program. International Standard Book no. 0-7065-1247-2.

Descriptors: (*Marine biology, Pacific Ocean), (*Oceanographic data, Pacific Ocean), Water masses, Chemical properties, Carbon compounds, Zooplankton, Primary biological productivity, Larvae, Invertebrates, Foraminifera, Porifera, Crustacea, Brachiopoda, Fishes, Oceanographic surveys, Translations, USSR.
Identifiers: Kurile-Kamchatka Trench.

Contents:
- Water masses of the southern part of the Kurile-Kamchatka Trench during the summer of 1966;
- Chemical characteristics of the deep waters of the Kurile-Kamchatka Trench;
- Distribution of dissolved organic carbon in the water of the Kurile-Kamchatka Trench area;
- Amino acids in water, suspensions, and bottom sediments in the Kurile-Kamchatka Trench area;
- Organic matter in aqueous suspension in the Kurile-Kamchatka Trench area;
- Sedimentation in the Kurile-Kamchatka Trench;
- Some new data on the bottom relief of the Kurile-Kamchatka Trench;
- Primary production and pigments in the Kurile-Kamchatka Trench area during the summer of 1966;
- Vertical distribution of zooplankton in the Kurile-Kamchatka area of the Pacific Ocean;
- Distribution of pelagic larvae of bottom invertebrates in the Kurile-Kamchatka area;
- Benthic foraminifers of the Kurile-Kamchatka Trench area.

8B. Cartography

AD-750 750 PC$3.00/MF$0.95
Defense Mapping Agency Aerospace Center St Louis Mo Technical Translation Branch
ON ONE METHOD OF RELIEF REPRESENTATION AND THE POSSIBILITY OF AUTOMATING IT (OB ODNOM SPOSOBE IZOBRAZHENIYA RELEFA I VOZMOZHNOSTI EGO AVTOMATIZATSII),
A. I. Martynenko, and P. A. Shcherbakov. Sep 72, 16p Rept no. DMAAC-TC-1865
Trans. of Geodeziya i Kartografiya (USSR) n1 p52-58 1972, by J. Doerer.

Descriptors: (*Mapping, Automation), Terrain, Visual perception, USSR.
Identifiers: Translations.

The paper contains a presentation of a simple practical method to automate and represent relief drawings. The method provides automatic engraving of contour lines with thickening of the lines in the lightest and darkest places. A method of 'drawing' contour lines with a laser beam on a photographic base is discussed, along with its drawbacks and advantages. (Author)

N72-28257 PC$3.75/MF$0.95
Michigan Univ., Ann Arbor. Willow Run Labs.
MAINTENANCE AND OPERATION OF THE MULTISPECTRAL DATA COLLECTION AND REPRODUCTION FACILITIES OF THE WILLOW RUN LABORATORIES.
Interim Report, Jan. 1970 - Jun. 1971
P. G. Hasell, Jr., and S. R. Stewart. Jun 72, 32p
NASA-CR-115710, WRL-25990-37-P
Contract NAS9-9304

Descriptors: *Aerial photography, *Mapping, *Multispectral band scanners, Airborne equipment, Data acquisition, Data processing equipment.

For abstract, see STAR 10 19.

N72-28364 PC$9.00/MF$0.95
Institut Fuer Angewandte Geodaesie, Frankfurt Am Main (West Germany).
REPORTS RELATIVE TO CARTOGRAPHY AND SURVEYING. SERIES 1 GERMAN CONTRIBUTIONS AND INFORMATION. NO. 54 PRECISION PROPERTIES OF PHOTOGRAMMETRIC MODEL COORDINATES . NACHRICHTEN AUS DEM KARTEN- UND VERMESSUNGSWESEN. REIHE 1 DEUTSCHE BEITRAEGE UND INFORMATIONEN. HEFT NR. 54 GENAUIGKEITSEIGENSCHAFTEN PHOTOGRAMMETRISCHER MODELLKOORDINATEN.
Ph.D. Thesis - Technische Hochschule, Karlsruhe
K. Schuerer. 1971, 137p

Descriptors: *Image motion compensation, *Photogrammetry, *Photomapping, *Polymeric films, Aerial photography, Error correcting devices, Imaging techniques, Optical correction procedure.

For abstract, see STAR 10 19.

N72-29283 PC$10.25/MF$0.95
Institut Fuer Angewandte Geodaesie, Frankfurt Am Main (West Germany).
REPORTS RELATIVE TO CARTOGRAPHY AND SERVEYING. SERIES 1 GERMAN CONTRIBUTIONS AND INFORMATION, NO. 53 . NACHRICHTEN AUS DEM KARTEN- UND VERMESSUNGSWESEN. REIHE 1 DEUTSCHE BEITRAEGE UND INFORMATIONEN.
1971, 156p

Descriptors: *Cadastral mapping, *Computer programs, *Photogrammetry, Geodetic surveys, Photointerpretation, Research projects.

For abstract, see STAR 10 20.

PB-212 728 PC$7.00/MF$0.95
Southeastern New Mexico Economic Development District, Roswell.
BASE MAPPING REPORT FOR SOUTHEASTERN NEW MEXICO ECONOMIC DEVELOPMENT DISTRICT: FIRST YEAR PLANNING PROGRAM 1972.
Final rept.
Jun 72, 97p SNMEDD-72-02

Descriptors: (*Maps, Land surveys), (*Land use, Regional planning), (*Regional planning, *New Mexico), Land titles, Topography, River basins, Classifications, Natural resources, Transportation, Water supply, Sewers.
Identifiers: Base maps, Counties.

The report consists of maps which have been accumulated in the SNMEDD District. These will be utilized for detailed mapping and land use planning in the future.

8C. Dynamic Oceanography

AD-750 756 PC$3.00/MF$0.95
Western Michigan Univ Kalamazoo
COASTAL DYNAMICS ALONG MUSTANG ISLAND, TEXAS.
Technical rept.,
Richard A. David, Jr., and William T. Fox. 1 Oct 72, 76p Rept nos. WMU-9, TR-9
Contract N00014-69-C-0151
Prepared in cooperation with Williams Coll. Errata sheet inserted.

Descriptors: (*Seacoast, Environment), (*Texas, Seacoast), Ocean waves, Wind, Barometric pressure, Interactions, Ocean currents, Tides, Velocity.
Identifiers: *Mustang Island, *Coastal processes, Sand bars, Rip channels, Longshore currents.

Two modified time-series studies were conducted along the Mustang Island, Texas coast during October-November, 1971 and January-February, 1972. Patterns exhibited by variations in monitored environmental variables show interrelationships that are quite comparable to those observed in eastern Lake Michigan. The dominating factor in controlling coastal processes along the Texas coast is barometric pressure. Large scale fluctuations occur as cold fronts ('northers') move through the area in an offshore direction. Changes in wind direction and velocity, breaker height, and longshore current direction and velocity accompany the passage of these fronts. The responses of beach and nearshore topography to the above changes in conditions are also much like those observed in Lake Michigan. (Author)

AD-750 842 PC$8.75/MF$0.95
Translation Consultants Ltd Arlington Va
ATLAS OF VARIATIONS IN THE OCEAN-ATMOSPHERE SYSTEM IN THE NORTH ATLANTIC. ISSUE 6. SEASONAL VARIATIONS IN TIDAL PHENOMENA AND INTERNAL WAVES,
L. I. Boris. 26 May 72, 133p NOO-Trans-45
Contract N62306-72-M-1386
Trans. of mono. Atlas izmenenii Sostoyaniya Sistemy Okean-Atmosfera v Severnoi Atlantike. Vypusk 6. Sezonnye Izmeneniya Prilivnykh Yavlenii i Vnutrennikh Voln, Moscow 1970.

Descriptors: (*Ocean waves, Atlantic Ocean), Periodic variations, Microbarometric waves, Tides, Equations of motion, Curve fitting, Graphics, Maps, Ocean currents, Numerical analysis, Atmospheric motion, Interactions.
Identifiers: Internal gravity waves, Seasonal variations, *Air water intersctions, North Atlantic Ocean, Translations.

Computations of seasonal variations in internal waves and tidal phenomena in the northern Atlantic Ocean are presented. The calculations are made for tides using Hansen's equations assuming a homogeneous ocean and for internal waves using the method suggested by Fjeldstad. Then variations in vertical density were incorporated in the calculations to provide preliminary information on tidal phenomena in an inhomogeneous ocean. Computations based on a theoretical model were modified and checked using direct observations. Charts show tides and tidal currents for average astronomical conditions based on a homogeneous ocean, characteristic seasonal curves for internal waves, and currents associated with tides and internal waves. (Author)

COM-72-11318 Reprint
National Oceanic and Atmospheric Administration, Seattle, Wash. Pacific Oceanographic Labs.
WIND EFFECTS ON CURRENTS OBSERVED IN JUAN DE FUCA SUBMARINE CANYON,
Glenn A. Cannon. 24 Feb 72, 7p NOAA-72090703
Contract AT (45-1)-1725
Revision of report dated 10 Jan 72. Prepered in cooperation with Washington Univ., Seattle. Dept. of Oceanography. Contrib-651.
Pub. in Jnl. of Physical Oceanography, v2 n3 p281-285, Jul 72,

Descriptors: (*Ocean currents, Air water interactions), (*Submarine canyons, Ocean currents), Upwelling, Water flow.
Identifiers: Juan de Fuca Strait.

Juan de Fuca submarine canyon has depths exceeding 200 m extending completely across the continental shelf. Observations of currents in the canyon during winter 1970 showed relatively large currents and large excursions both in- and out-canyon. Three major flow reversals appear related to major wind reversals as a compensating current to an Ekman surface regime. A fourth wind reversal, not accompanied by flow reversal, indicates that along-canyon density gradients are also important. (Author)

N72-30344 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
CONCEPTS AND PROCEDURES USED TO DETERMINE CERTAIN SEA WAVE CHARACTERISTICS.
A. D. Cummings, A. M. Whitnah, D. B. Howes, and B. J. Wells. Sep 72, 27p NASA-TN-D-6961, S-245

Descriptors: *Spacecraft landing, *Surface waves, *Water landing, *Water waves, Neumann problem, Parameterization, Sea roughness, Wind effects.

For abstract, see STAR 10 21.

N72-30358 PC$3.00/MF$0.95
Istituto Di Fisica Dell Atmosfera, Rome (Italy).
CONSIDERATIONS ON CHARACTERISTIC PERIODS OF ADRIATIC SEA LEVEL OSCILLATIONS . CONSIDERAZIONI SUI PERIODI CARATTERISTICI DELLE OXCILLAZIONI DEL LIVELLO MARINO IN ADRIATICO.
S. Palmieri, and C. Finizio. Dec 70, 19p
IFA-STR-16
Subm- Sponsored By Min. Dei Lavori Pubblici Prepared Jointly With Aeron. Mil. Ital.

Descriptors: *Italy, *Level (horizontal), *Periodic variations, *Sea water, Mediterranean sea, Prediction analysis techniques, Sea states, Wind effects.

For abstract, see STAR 10 21.

N72-30363 PC$3.50/MF$0.95
Royal Aircraft Establishment, Farnborough (England).
AN ASSESSMENT OF THE SEA-STATE MEASUREMENT PROBLEM AT RAE ABERPORTH.
J. W. Cooper, and T. G. Wills. Oct 71, 27p
RAE-TR-71207, BR27442

Descriptors: *Great britain, *Missile ranges, *Parameterization, *Sea states, Height, Missile control, Missile tests, Ocean surface, Surveillance radar, Tides, Water waves, Wave propagation, Wind effects.

For abstract, see STAR 10 21.

8E. Geodesy

AD-750 307 PC$3.00/MF$0.95
Army Engineer Topographic Labs Fort Belvoir Va
ACCURATE EPHEMERIS TIME DETERMINATION AND GEOCENTRIC STATIONS POSITION FROM PHOTOGRAPHS OF THE MOON AGAINST STELLAR BACKGROUND,
Angel A. Baldini. 1972, 15p

Descriptors: (*Astronomical geodesics, Position finding), Direction finding, Time, Photointerpretation, Moon, Stars.

The investigation is done by strictly geometrical methods. Accurately recorded time correlated moon and star images on photographic plates, allow one to obtain the apparent direction to the moon in terms of the celestial right ascension and declination system.

AD-750 424 PC$3.00/MF$0.95
Royal Aircraft Establishment Farnborough (England)
15TH-ORDER HARMONICS IN THE GEOPOTENTIAL, FROM ANALYSIS OF DECAYING SATELLITE ORBITS.
Technical rept.,
D. G. King-Hele. Jun 72, 17p Rept no. RAE-TR-72115 DRIC-BR-29622

Descriptors: (*Gravity, Potential energy), (*Orbital trajectories, Perturbation theory), Satellites (Artificial), Drag, Harmonic analysis, Resonance, Great Britain.
Identifiers: *Geopotential, Ariel 3 satellite, Transit 1B satellite, Cosmos 316 satellite, Cosmos 373 satellite, Cosmos 387 satellite.

A satellite with an initial orbital period greater than about 96 minutes will, as it decays under the action of air drag, pass through 15th-order resonance when successive equator crossings are exactly 24 degrees apart, so that each day the satellite follows a fixed set of 15 ground tracks. If the decay is slow enough, the inclination i of the orbit to the equator changes appreciably as the satellite passes through resonance, because of the build-up of perturbations caused by the tesseral harmonics in the Earth's gravitational potential of order 15 and degree 15, 17, 19, 21 ... . Equations between the coefficients of these harmonics can be obtained by analyzing the changes in orbits at a variety of inclinations, offering a method of evaluating 15th-order harmonics almost free of contamination from other harmonics. The paper describes the results so far obtained in these studies, from the satellites Ariel 3 (i = 80 degrees), Transit 1B (i = 51 degrees), Cosmos 373 (i = 63 degrees) Cosmos 387 (i = 74 degrees). A set of values is derived for the coefficients of order 15 and degree 15, 17, 19 and 21. (Author)

AD-750 749 PC$3.00/MF$0.95
Defense Mapping Agency Aerospace Center St Louis Mo Technical Translation Branch
TRENDS IN SATELLITE GEODESY (ENTWICKLUNGSTENDENZEN DER SATELLITENGEODAESIE),
L. Stange. Oct 72, 17p Rept no. DMAAC-TC-1855
Trans. of Vermessungstechnik (East Germany) v19 n3 p81-85 1971, by Sharon Wahrenburg.

Descriptors: (*Satellite tracking systems, East Germany), Geodesics, Range finding, Gravity, Potential energy, Harmonic analysis.
Identifiers: Translations, Geodetic satellites, *Celestial geodesy.

The paper discusses the probability of further developments of satellite geodesy, based on the results achieved so far. An increase in observation accuracy results in an immediate increase in the accuracy of the derived geodetic elements. It also opens new fields for satellite geodesy and forces a proper refinement of the underlying physico-mathematical models. (Author)

N72-28352 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
FOUR DIMENSIONAL STUDIES IN EARTH SPACE.
R. S. Mather. Jul 72, 29p NASA-TM-X-65958, X-553-72-230

Descriptors: *Earth (planet), *Gravitational fields, *Reference systems, Geophysics, Variations.

For abstract, see STAR 10 19.

N72-28360 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
POLAR MOTION FROM LASER TRACKING OF ARTIFICIAL SATELLITES.
D. E. Smith, R. Kolenkiewicz, P. J. Dunn, H. H. Plotkin, and T. S. Johnson. Jul 72, 8p
NASA-TM-X-63964, X-553-72-247
Subm- Submitted for Publication

Descriptors: *Latitude measurement, *Satellite tracking, Explorer 27 satellite, Laser range finders.

For abstract, see STAR 10 19.

N72-29423 PC$4.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
GRAVITATIONAL FIELD MODELS FOR THE EARTH (GEM 1 AND 2).
F. J. Lerch, C. A. Wagner, D. E. Smith, M. L. Andson, and J. E. Brownd. May 72, 41p
NASA-TM-X-65970, X-553-72-146

Descriptors: *Geomagnetism, *Gravitational fields, Geopotential, Gravimetry, Optical tracking, Satellite tracking.

For abstract, see STAR 10 20.

8F. Geography

AD-750 732 PC$3.00/MF$0.95
East Tennessee State Univ Johnson City Remote Sensing Inst
THE DEVELOPMENT OF CRITERIA FOR RECOGNIZING AND IDENTIFYING SLOPE FAILURE FORMS AS DEPICTED BY REMOTE SENSOR RETURNS.
Technical rept.,
Donald H. Poole. 1971, 63p Rept no. TR-12
Contract N00014-67-A-0102-0001

Descriptors: (*Terrain, Aerial photography), (*Erosion, Photointerpretation), Aerial photographs, Infrared photography, Color photography, Multiband spectral reconnaissance, Avalanches, Rock (Geology), North Carolina.
Identifiers: *Remote sensing, Slopes, Buncombe County (North Carolina), Henderson County (North Carolina), Madison County (North Carolina), Transylvania County (North Carolina).

The study shows that the criteria developed from photographic images depicted by remote sensing photography from NASA's North Carolina Test Site is based largely on pattern, color contrast, and geometric form. Patterns are best reflected in the erosional forms of sheet wash, rill wash, and gullying, and in the mass wastage forms of soil creep and rock fall and rock creep. Color contrast is significant in differentiating all erosional and mass wastage forms of slope failure. The color contrast between an object and its background is frequently the only means of establishing recognition. Geometric form is relied upon most often in recognizing and establishing the identity of the rapid forms of mass wastage, i.e. slump, earth flow, debris slide and rock slide.

AD-750 733 PC$3.00/MF$0.95
East Tennessee State Univ Johnson City Remote Sensing Inst
THE DISTRIBUTION OF SLOPE FAILURE FORMS AS DEPICTED BY REMOTE SENSOR RETURNS.
Technical rept.,
Donald H. Poole. 1971, 40p Rept no. TR-13
Contract N00014-67-A-0102-0001

Descriptors: (*Terrain, Aerial photography), (*Erosion, Photointerpretation), Maps, North Carolina.
Identifiers: *Remote sensing, Slopes, Buncombe County (North Carolina), Henderson County (North Carolina), Madison County (North Carolina), Transylvania County (North Carolina).

The objective of the study is to map the distribution of slope failure forms as they are depicted by the remote sensor photography made available to the investigator. No attempt has been made to regionalize their distribution, either quantitatively or qualitatively, except to note the general relationships existing between patterns of distribution and the rocks, soils, and land use practices characteristic of the study area.

AD-750 735 PC$3.00/MF$0.95
East Tennessee State Univ Johnson City Remote Sensing Inst
AN EVALUATION OF THE UTILITY OF AVAILABLE REMOTE SENSOR RETURNS FOR A STUDY OF SLOPE FAILURE PHENOMENA.
Technical rept.,
Donald H. Poole. 1971, 40p Rept no. TR-14
Contract N00014-67-A-0102-0001

Descriptors: (*Terrain, Aerial photography), (*Erosion, Photointerpretation), Aerial photography, Infrared photography, Color photography, Multiband spectral reconnaissance, North Carolina.
Identifiers: *Remote sensing, Slopes, Buncombe County (North Carolina), Henderson County (North Carolina), Madison County (North Carolina), Transylvania County (North Carolina).

The object of this investigation is to evaluate the utility of the photographs from NASA's North Carolina Test Site 46 for studying slope failure phenomena. Slope failure forms depicted by the photography include both erosional and mass wastage forms. The imagery made available to the investigator includes the following: Ektachrome, Ektachrome infrared, panchromatic, and multispectral nine-lens photography. The Ektachrome and Ektachrome infrared was available from each of the five missions conducted in the area of study (Missions 14,23, 34,53, and 65). The multi-spectral nine-lens was available from two missions (14 and 23), and the panchromatic photography was available from a single mission (14).

N72-28326 PC$5.00/MF$0.95
Oregon State Univ., Corvallis. Forestry Remote Sensing Lab.
INVENTORY AND ANALYSIS OF NATURAL VEGETATION AND RELATED RESOURCES FROM SPACE AND HIGH ALTITUDE PHOTOGRAPHY.
Annual Progress Report
C. E. Poulton, D. P. Faulkner, J. R. Johnson, D. A. Mouat, and B. J. Schrumpf. 30 Sep 71, 59p
NASA-CR-127697
NASA ORDER R-09-038-002
Subm- Prepared in Cooperation With the Dept. of Agriculture

Descriptors: *Aerial photography, *Earth resources program, *Photointerpretation, *Spaceborne photography, Agriculture, Earth resources, Earth resources survey aircraft, Land use, Remote sensors, Soil mapping, Urban development, Vegetation.

For abstract, see STAR 10 19.

N72-28327 PC$5.75/MF$0.95
Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo. Forestry Remote Sensing Lab.
MULTISTAGE, MULTIBAND AND SEQUENTIAL IMAGERY TO IDENTIFY AND QUANTIFY NON-FOREST VEGETATION RESOURCES.
Annual Progress Report
R. S. Driscoll. 30 Sep 71, 75p
NASA ORDER R-09-038-002
Subm- Prepared in Cooperation With the Dept. of Agriculture

Descriptors: *Earth resources program, *Multispectral band scanners, *Photointerpretation, *Plants (botany), Aerial photography, Earth resources, Microdensitometers, Remote sensors, Soil mapping, Spaceborne photography, Vegetation.

For abstract, see STAR 10 19.

N72-28328 PC$3.00/MF$0.95
Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.
THE DEVELOPMENT OF AN EARTH RESOURCES INFORMATION SYSTEM USING AERIAL PHOTOGRAPHS AND DIGITAL COMPUTERS.
Annual Progress Report
E. L. Amidon, D. A. Sharpnack, and R. M. Russell. 30 Sep 71, 10p NASA-CR-127690
NASA ORDER R-09-038-002

Descriptors: *Aerial photography, *Digital techniques, *Earth resources program, *Photointerpretation, *Photomapping, Digital computers, Earth resources, Forests, Information systems, Photogrammetry, Terrain analysis.

For abstract, see STAR 10 19.

N72-28334 PC$5.25/MF$0.95
Biospherics, Inc., Rockville, Md.
AIRBORNE MICROWAVE RADIOMETRIC DATA ANALYSIS, PART 2.
Final Report
13 Jun 72, 62p NASA-CR-122444
Contract NAS5-21674

Descriptors: *Arizona, *California, *Microwave equipment, *Remote sensors, Airborne equipment, Data processing, Earth resources, Photography, Sampling, Soils.

For abstract, see STAR 10 19.

N72-28366 PC$30.75/MF$0.95
Michigan Univ., Ann Arbor. Willow Run Labs.
THE NASA EARTH RESOURCES SPECTRAL INFORMATION SYSTEM A DATA COMPILATION.
V. Leeman, D. Earing, R. K. Vincent, and S. Ladd. May 71, 574p NASA-CR-115757, WRL-31650-24-T
Contract NAS9-9784

Descriptors: *Earth resources program, *Graphs (charts), *Spectral signatures, Emittance, Minerals, Reflectance, Rocks, Soils, Transmittance, Vegetation, Water.

For abstract, see STAR 10 19.

N72-28374 PC$3.75/MF$0.95
Toronto Univ. (Ontario). Faculty of Forestry.
CONSIDERATIONS INDETERMINATION, EVALUATION AND COMPUTER BANKING OF SPECTRAL SIGNATURES OF NATURAL OBJECTS.
J. Vlcek. Mar 72, 31p FMR-22
Subm- Sponsored By Forest Management Inst.

Descriptors: *Aerial photography, *Data processing, *Remote sensors, *Spectral reflectance, Computer storage devices, Data storage, Earth resources, Spectral signatures, Statistical analysis.

For abstract, see STAR 10 19.

N72-28376 PC$23.25/MF$0.95
Centre National Detudes Spatiales, Bretigny-sur-orge (France).
REMOTE SENSING OF EARTH RESOURCES . LA TELEDETECTION DES RESSOURCES NATURELLES.
Oct 71, 425p
LANG- PARTLY IN ENGLISH AND PARTLY IN FRENCH

Descriptors: *Conferences, *Earth resources program, *France, *Remote sensors, *Technology assessment, Aerial photography, Earth resources, Geographic applications program, Ground truth, Imaging techniques, Infrared imagery, Photointerpretation, Soil mapping, Terrain analysis.

For abstract, see STAR 10 19.

N72-29301 PC$5.00/MF$0.95
Aerospace Engineering Test Establishment, Ottawa (Ontario).
CF-100 HIGH ALTITUDE REMOTE SENSING PROJECT.
Earth Resources Cf-100 Handbook
1972, 58P REPORT-1000149
Misc- Compiled and Amended Monthly By Aets Uplands

Descriptors: *Aerial reconnaissance, *High altitude, *Multispectral photography, *Remote sensors, Aerial photography, Canadair aircraft, Earth resources, Earth resources survey aircraft.

For abstract, see STAR 10 20.

N72-29302 PC$27.50/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
FOURTH ANNUAL EARTH RESOURCES PROGRAM REVIEW. VOLUME 1 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION PROGRAMS.
21 Jan 72, 509p NASA-TM-X-68564, MSC-05937-VOL-1
Conf- Rev. Held At Houston, Tex., 17-21jan. 1972

Descriptors: *Conferences, *Earth resources program, *Nasa programs, Forests, Geography, Geology, Hydrology, Oceanography.

For abstract, see STAR 10 20.

N72-29327 PC$30.50/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
FOURTH ANNUAL EARTH RESOURCES PROGRAM REVIEW. VOLUME 2 UNIVERSITY PROGRAMS.
21 Jan 72, 606p NASA-TM-X-68397, MSC-05937-VOL-2
Conf- Rev. Held in Houston, Tex., 17-21jan. 1972

Descriptors: *Computer techniques, *Conferences, *Data processing, *Earth resources, *Multispectral band scanners, *Multispectral photography, *Remote sensors, *Terrain analysis, Aerial photography, Agriculture, Crop identification, Earth resources program, Land use, Nasa programs, Soil mapping, Technology transfer, University program, Water resources.

For abstract, see STAR 10 20.

N72-29378 PC$24.75/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
FOURTH ANNUAL EARTH RESOURCES PROGRAM REVIEW. VOLUME 4 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION PROGRAMS AND US NAVAL RESEARCH LABORATORY PROGRAMS.
21 Jan 72, 451p NASA-TM-X-68563, MSC-05937-VOL-4
Conf- Rev. Held At Houston, Tex., 17-21 Jan. 1972

Descriptors: *Conferences, *Earth resources program, *Remote sensors, Agriculture, Forests, Geology, Hydrology, Nasa programs, Oceanography, University program.

For abstract, see STAR 10 20.

8G. Geology and Mineralogy

AD-750 707 PC$3.00/MF$0.95
Bureau of Mines Minneapolis Minn Twin Cities Mining Research Center
ROCK CLASSIFICATION AND ROCK PROPERTY INDEX.
Annual technical rept.,
Warren W. Krech. 1 Mar 72, 13p Rept no. P79-2
ARPA Order-1579

Descriptors: (*Rock (Geology), Structural properties), Classification, Identification, Standards, Granite, Basalt, Quartz, Sandstone, Limestone, Indexes, Reviews.
Identifiers: *Rock mechanics, Quartzite, Granodiorite.

A suite of eight rock types commonly used in rock mechanics research has been obtained from quarries in oriented lots, and are being distributed as one-cubic foot blocks to ARPA participants at their request. Mechanical property testing is underway on all eight ARPA rock types. A manuscript for reporting the test results is underway. A comprehensive listing of rock property data obtained from Bureau of Mines and outside literature review on rock classification for engineering purposes has been completed, and development of a qualitative rock classification system is underway. (Author)

AD-750 708 PC$3.00/MF$0.95
Bureau of Mines Minneapolis Minn Twin Cities Mining Research Center
ADHESION IN ROCK.
Final rept. 1 Feb-31 Dec 71,
George A. Savanick, and Donald I. Johnson. 1 Mar 72, 30p Rept no. P80-2
Contract ARPA Order-1579

Descriptors: (*Rock (Geology), Mechanical properties), (*Fracture (Mechanics), *Test methods), Adhesion, Tensile properties, Grain boundaries, Separation, Quartz, Feldspar, Granite.
Identifiers: *Rock fragmentation, Pegmatite, Rock mechanics.

A direct method has been developed for estimating the strength of intergranular adhesion in rock. It involves the separation of a bicrystal from the rock and a determination of the tensile strength at the solid-solid interface. This technique has been successfully applied to the study of quartz-feldspar interfaces separated from pegmatites, graphic granite, and the Rockville granite yielding average tensile strengths of 5.86, 8.62, and 10.65 MN/msq (850, 1,250, and 1,524 psi) respectively. The data generated by this technique indicate that the members of these bicrystals are strongly adhernet. Examination of bicrystals broken at the crystalline interfaces indicates that the bonds responsible for this adhesion operate only over a protion of the interfacial area. The significance of this work is that it demonstrates that tensile strength tests can be conducted on small selected areas, e.g. grain boundaries in rock. This permits a determination of small scale zones of strength or weakness which may be related to the overall strength of the rock. Selected area microindentation hardness testing has also been performed to probe hardness variations near phase boundaries.

AD-750 751 PC$3.00/MF$0.95
Defense Mapping Agency Aerospace Center St Louis Mo Technical Translation Branch
USING DETAILED GRAVIMETRY FOR EXPLORATION OF UNDERTHRUST STRUCTURES IN NORTHERN SAKHALIN (PRIMENENIE DETALNOI GRAVIMETRII DLYA POISKOV PODNADVIGOVYKH STRUKTUR NA SEVERNOM SAKHALINE),
A. A. Tereshchenkov, and V. E. Kononov. Sep 72, 11p Rept no. DMAAC-TC-1866
Trans. of Neftegazovaya Geologiya i Geofizika (USSR) n2 p49-52 1972, by George Synenko.

Descriptors: (*Gravity, Anomalies), (*Structural geology, Geophysical prospecting), Faults (Geology), Petroleum, USSR.
Identifiers: Translations, Gravity anomalies, Oil reservoirs, Gas reservoirs, Petroleum geology.

At present, a method for exploration of underthrust anticlinal structures for Northern Sakhalin has not been worked out. One of the methods which makes it possible, to a certain degree, to define the structure of underthrust formations is detailed gravimetry. The paper discusses the detailed gravimetry method. (Author)

AD-750 864 Reprint
Lamont-Doherty Geological Observatory Palisades N Y
MAGNETIC LINEATIONS OF EARLY CRETACEOUS AGE IN THE WESTERN EQUATORIAL PACIFIC OCEAN,
Roger L. Larson, Stuart M. Smith, and Clement G. Chase. 18 May 72, 7p Rept no. LDGO-1794
Contract N00014-67-A-0108-0004
Prepared in cooperation with Scripps Institution of Oceanography, San Diego, La Jolla, Calif. and Minnesota Univ., Minneapolis. Dept. of Geology and Geophysics. Revision of report dated 21 Apr 72.
Availability: Pub. in Earth and Planetary Science Letters, v15 p315-319 1972.

Descriptors: (*Marine geophysics, *Pacific Ocean), Magnetic anomaly detection, Terrestrial magnetism, Geologic age determination.
Identifiers: Magnetic anomalies.

Magnetic anomaly lineations just north of the Phoenix Islands in the western equatorial Pacific trend N 80 degrees E for over 1400 km. They are off-set 180 km left-laterally along an interior fracture zone and truncated to the west by another zone. It is not clear how they are terminated to the east. A Deep Sea Drilling Project hole dates these lineations as about 120 mybp. They represent 20 my or less of history from one flank of an early Cretaceous spreading system. (Author)

AD-750 883 Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
COMMENTS ON A PAPER BY WATKINS AND RICHARDSON: INTRUSIVES, EXTRUSIVES AND LINEAR MAGNETIC ANOMALIES,
C. G. A. Harrison. 19 Nov 71, 5p Rept no. Contrib-1468
Contract N00014-67-A-0201-0013
Errata sheet inserted.
Availability: Pub. in Geophysical Jnl. of the Royal Astronomical Society, v28 p187-189 1972.

Descriptors: (*Structural geology, Magnetic anomaly detection), Terrestrial magnetism, Magnetic fields, Anomalies, Ocean bottom.
Identifiers: Magnetic anomalies.

Watkins and Richardson (1971) attempted to show that the presence of extrusions will, under certain conditions, produce sharper magnetic anomalies at the ocean surface than will the absence of these extrusions. The author explains why he believes the conclusions drawn from their calculations are invalid.

AD-750 884 Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
EXPLORATION METHODS FOR STRATIGRAPHIC TRAPS IN CARBONATE ROCKS,
Mahlon M. Ball. 14 Jul 71, 20p Rept no. Contrib-1415
Contract N00014-67-A-0201-0013, Grant NSF-GB-27252
Revision of report dated 2 Jun 71.
Availability: Pub. in Stratigraphic Oil and Gas Fields-Classification, Exploration Methods, and Case Histories, the American Association of Petroleum Geologists (Memoir 16) and the Society of Exploration Geophysicists (Special Publication No. 10), p64-81 1972.

Descriptors: (*Geophysical prospecting, Petroleum), (*Petroleum, *Structural geology), Stratigraphy, Sedimentary rock, Rock (Geology), Hydrocarbons, Anomalies.
Identifiers: *Stratigraphic traps, *Carbonate rocks, Devonian reefs.

It is commonly impossible to distinguish structure due to deposition and erosion from tectonic structure. Moreover, stratigraphic agents producing trap limits are usually dependent on tectonic influences. It is thus impractical to contrast stratigraphic versus structural traps with the intention of searching for one type and not searching for the other. This is most clear in the case of carbonate traps where tectonism controls development of both erosional and depositional structure and affects depositional and diagenetic facies distribution. (Author)

AD-750 887 Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
ORIGIN OF THE DISTURBED MAGNETIC ZONE BETWEEN THE MURRAY AND MOLOKAI FRACTURE ZONES,
C. G. A. Harrison, and J. G. Sclater. 7 Jan 72, 9p Rept no. Contrib-1466
Contract N00014-67-A-0201-0013
Prepared in cooperation with Scripps Institution of Oceanography San Diego, Calif. Marine Physical Lab. Revision of report dated 15 Mar 71.
Availability: Pub. in Earth and Planetary Science Letters, v14 p419-427 1972.

Descriptors: (*Structural geology, *Pacific Ocean), (*Terrestrial magnetism, Magnetic anomaly detection), Mathematical models, Faults (Geology), Geologic age determination.
Identifiers: Murray Fracture Zone, Molokai Fracture Zone, Magnetic anomalies, Ocean bottom spreading.

Two different hypotheses have been advanced to explain the disturbed magnetic zone between the Murray and Molokai fracture zones, and the change in offset of the magnetic anomalies across the eastern and western portions of the Murray fracture zone. The first calls for an abrupt jump of the spreading center 530 km eastwards at 51 mybp (between anomaly 21 and abnomaly 20). The second calls for a secondary spreading center starting just to the west of the primary center and moving away from it. The secondary center was active between 38 mybp (anomaly 15) and 27 mybp (anomaly 7). A third hypothesis, advanced in this paper, is that the ridge crest jumped eastwards 530 km, as in the first hypothesis, but at a much later time, 40 mybp. The postulated ages of the various portions of the sea floor between the Murray and Molokai fracture zones are radically different for the three models. (Author)

AD-750 888 Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
RARE EARTH ELEMENT DISTRIBUTIONS IN EQUATORIAL MID-ATLANTIC RIDGE GABBROS,
Carl E. Schubert. 17 Feb 72, 8p Rept no. Contrib-1501
Contract N00014-67-A-0201-0013
Availability: Pub. in Nature Physical Science, v237 n71 p26-28, 8 May 72.

Descriptors: (*Marine geology, *Atlantic Ocean), (*Igneous rock, *Rare earth elements), Ocean bottom topography, Petrography, Ocean bottom sampling.
Identifiers: Gabbro, *MidAtlantic ridge, Earth crust.

The crustal sections exposed in the fracture zones of the equatorial Mid-Atlantic Ridge afford the

deepest direct sampling of the crust. The gabbros, amphibolites and greenschists underlie basalts and are differentiated along a tholeiitic trend during slow cooling. The variations in the chemistry of the principal elements are greater for the coarse grained rocks than for the basalts as shown on the alkali-iron-magnesium diagram. Oceanic tholeiites are normally considered to have uniform chondrite normalized rare earth element (REE) patterns, charcterized by La depletion, little or no Eu anomaly, and abundances ten to twenty-five times that of chondrites. The conditions leading to the largest variations of the principal elements in the intrusives should also lead to greater REE diversity.

N72-28345 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
PLATE DRIFT IN THE AFAR AND ISSAS TERRITORY (FRENCH SOMALIA) AND EASTERN ETHIOPIA AS SEEN ON SPACE PHOTOGRAPHY.
D. Bannert. Jun 72, 26p NASA-TN-D-6277, MSC-S-253
Misc- Original Contains Color Illustrations

Descriptors: *Apollo 9 flight, *Continental drift, *Red sea, *Spaceborne photography, Africa, Earth planetary structure, Rocks, Tectonics.

For abstract, see STAR 10 19.

N72-28365 PC$7.75/MF$0.95
Bureau of Mineral Resources, Geology and Geophysics, Canberra (Australia).
LAVERTON-EDJUDINA AIRBORNE MAGNETIC AND RADIOMETRIC SURVEY, WESTERN AUSTRALIA 1969.
D. B. Tipper, and R. M. Gerdes. 1971, 112p BULL-118

Descriptors: *Australia, *Geology, *Magnetic surveys, *Mapping, Airborne equipment, Igneous rocks, Metals, Mineral deposits, Radiometers, Stratigraphy.

For abstract, see STAR 10 19.

N72-28767 PC$4.75/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
COMPUTER PROGRAMS FOR CALCULATION OF THERMODYNAMIC FUNCTIONS OF MIXING IN CRYSTALLINE SOLUTIONS.
P. A. Comella, and S. K. Saxena. Jul 72, 51p NASA-TM-X-65965, X-641-72-249

Descriptors: *Computer programs, *Solid solutions, *Thermodynamics, Input/output routines, Minerals, Rocks.

For abstract, see STAR 10 19.

N72-29355 PC$17.50/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
FOURTH ANNUAL EARTH RESOURCES PROGRAM REVIEW. VOLUME 3 US GEOLOGICAL SURVEY PROGRAMS.
21 Jan 72, 309p NASA-TM-X-68398, MSC-05937-VOL-3
Conf- Rev. Held At Houston, Tex., 17-21jan. 1972

Descriptors: *Conferences, *Earth resources technology satellites, *Environment pollution, *Mapping, *Mineral exploration, *Remote sensors, Earth resources program, Environmental surveys, Hydrology, Satellite observation, Wetlands.

For abstract, see STAR 10 20.

N72-30345 PC$10.00/MF$0.95
Michigan Univ., Ann Arbor. Infrared and Optics Lab.
THE NASA EARTH RESOURCES SPECTRAL INFORMATION SYSTEM A DATA COMPILATION, FIRST SUPPLEMENT.
V. Leeman. 1972, 159p NASA-CR-115756, WRL-31650-69-T-SUPPL-1
Contract NAS9-9784

Descriptors: *Earth resources, *Graphs (charts), *Minerals, *Rocks, *Soils, *Spectral signatures, *Vegetation, Earth resources program, Emittance, Polarization (waves), Reflectance, Remote sensors, Transmittance.

For abstract, see STAR 10 21.

PB-212 653 PC$3.00/MF$0.95
Bureau of Mines, Washington, D.C.
HYDROCARBON GASES PRODUCED IN A SIMULATED SWAMP ENVIRONMENT.
Rept. of investigations,
Ann G. Kim, and L. J. Douglas. Sep 72, 19p BuMines-RI-7690
Prepared in cooperation with Bureau of Mines, Pittsburgh, Pa. Pittsburgh Mining and Safety Research Center.

Descriptors: (*Swamps, *Hydrocarbons), (*Coal gas, *Biodeterioration), Mine gases, Methane, Carbon dioxide, Cellulose, Plants (Botany), Lignin, Gas analysis, Safety.
Identifiers: *Coalification, Swamp gases.

Coal formation begins in peat swamps or bogs, in which microorganisms alter plant material and initiate the formation of carbonaceous sediments. Methane, which constitutes about 98 percent of the hydrocarbon gas in coalbeds, is known to be a product of anaerobic microbial metabolism. To determine if other hydrocarbon gases could be produced in an environment similar to that of a swamp, samples of wood cellulose and lignin were innoculated with soil microorganisms and incubated anaerobically. The resultant gases included methane, ethylene, propane, propylene, butanes, pentanes and carbon dioxide. Hydrogen was also produced from the wood samples during the first month of incubation. Over 90 percent of the produced gas was methane. Although higher hydrocarbons could be produced in a swamp environment, subsequent mechanisms must affect the final concentration of higher hydrocarbons in coalbeds. (Author)

PB-212 685 PC$3.00/MF$0.95
Woods Hole Oceanographic Institution, Mass.
ASPECTS OF THE BIOGEOCHEMISTRY OF CARBOHYDRATES AND PROTEINS IN AQUATIC ENVIRONMENTS.
Technical rept. Dec 70-Jul 72,
Kenneth Mopper, and Egon T. Degens. Sep 72, 249p WHOI-72-68
Prepared in cooperation with National Science Foundation, Washington, D.C.

Descriptors: (*Dissolved organic matter, *Sedimentology), (*Sediments, Chemical analysis), (*Diagenesis, Organic compounds), Complex compounds, Sugars, Hydrolysis, Amino acids, Water analysis, Geochemistry, Plankton, Sea water, Concentration (Composition).
Identifiers: Biogeochemistry.

Data is presented on the sugar and amino acid compositions of sediment from various environments, sea water, organisms, and organic waste materials (sewage sludges). Based on this data, a unified picture of the major processes and cycles which affect the transformation of organic matter in aquatic and sedimentary environments is given. (Author)

PB-212 753 PC$3.00/MF$0.95
California Assembly General Research Committee, Sacramento. Assembly Science and Technology Advisory Council.
GEOTHERMAL RESOURCES IN CALIFORNIA--POTENTIALS AND PROBLEMS,
Martin Goldsmith, and Elizabeth Rolph. May 72, 76p
Contract NSF-GT-6

Descriptors: (*Geothermal prospecting, *California), (*Natural resources, Exploitation), Geysers, Steam, Energy, Electric power production, Feasibility, Water resources, Desalting, Cooling, Cost analysis, Waste water.
Identifiers: *Geothermal resources, Imperial Valley, Mono Lake.

The report was prepared at the request of the California State Assembly Speaker to evaluate the potential role of geothermal resources in meeting the demand for energy in California. The study covers the extent of geothermal resources in California and the technology, cost and environmental effects of exploitation of the resources. Initial research and writing of the report was done by Dr. Martin Goldsmith of the Environmental Quality Laboratory, California Institute of Technology. The findings and conclusions of the report were formulated and endorsed by the Panel on Energy Planning and Programs. (Author)

PB-212 774 PC$3.00/MF$0.95
National Swedish Inst. for Building Research, Stockholm.
A SYSTEM OF DESCRIBING AND CLASSIFYING INFORMATION CONCERNING LAND FORMS,
Building research,
Sven G. Moller. 1972, 81p D8:1972
International standard book no. 91-540-2041-7.
Also available from: Svensk Byggtjanst, Box 1403, S-111 84. Stockholm, Sweden. PC. Price: Sw.Kr.18.

Descriptors: (*Landforms, Classification), (*Land use, *Regional planning), (*Physical geography, *Aerial surveys), Photointerpretation, Landscaping, Urban planning, Community development, Forestry, Agriculture, Data processing, Computer programming, Classifications, Sweden.
Identifiers: Descriptions.

All planning of a landscape for some purpose such as community development of agriculture-forestry is preceded by and based on an inventory at three strata of the information relating to the landscape, physical geography, urban geography and present land use. The future land use is studied and laid down in the plan. The report contains an account of an outline system for the description and classification of the natural and the cultural landscape as a step in the formulation of a Swedish system of aerial photographic interpretation.

8H. Hydrology and Limnology

AD-750 371 PC$3.00/MF$0.95
Army Project Mobile Army Sensor Systems Test Evaluation and Review Activity Fort Hood Tex
A PROBABILISTIC MODEL FOR STRUCTURING A DRAINAGE NETWORK,
R. T. Robinson, and A. J. Swartz. 1972, 14p

Descriptors: (*Rivers, Mathematical models), Drainage, Networks, Probability, Tables.
Identifiers: Streams, Watersheds, *Geomorphology.

A model is given which describes the behavior of a mature drainage network in terms of four network parameters. The principal parameters are stream length ratio (alpha) and bifurcation ratio (beta). The (alpha, beta)-pairs lie within an admissable region bounded by implicit functions. The model is amenable to computer solution and may be used to estimate the number, sizes and interfluvial

distances of streams to be crossed whn traversing a drainage basin, or succession of basins, with a force of varying width.

AD-750 782 PC$3.00/MF$0.95
Massachusetts Univ Amherst Coastal Research Center
SEDIMENTATION AND PHYSICAL LIMNOLOGY IN PROGLACIAL MALASPINA LAKE, ALASKA.
Technical rept.,
Thomas C. Gustavson. Aug 72, 55p Rept no. TR-5-CRC
Contract N00014-67-A-0230-0001

Descriptors: (*Lakes, Sedimentation), (*Alaska, Lakes), Glaciers, Flow fields, Thermoclines, Density.
Identifiers: Lake Malaspina, *Glacial geology, Limnology, Suspended sediments.

Glaciolacustrine varved sediments are presently being deposited in Malaspina Lake, which lies along the southeastern margin of the Malaspina Glacier. Malaspina Lake waters exhibit a reverse thermal stratification. Two large surface streams, Russell Stream and Tarr Stream, flow into the lake and their combined discharge is 140 cms. Discharge from the lake is as much as 600 cms, thus subglacial and englacial streams apparently discharge as much as 460 cms into the lake. Bottom topography of the lake is quite irregular except where the selective infilling of basins by turbidity currents has produced flat to gently sloping topography. Cores taken of these flat areas contain varved sediments. Varves, deposited at depths of 50 m or more, contain normal and reverse graded beds and horizontal beds. The current-bedded portion of the varve was deposited from an underflow or turbidity current. The varve was completed by the deposition from suspension of a clay unit when continuous underflows, or turbidity currents, ceased during the winter months.

N72-28355 PC$3.25/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
SOME BEHAVIOR PATTERNS IN THE REDISTRIBUTION OF MOISTURE ON SLOPES.
Y. N. Romanova. Jul 72, 23p NASA-TT-F-14352
Contract NASW-2038
Tran- Transl. Into English From Tr. Gl. Geofiz. Observ. (Leningrad), No. 147, 1963 P 66-82

Descriptors: *Rain, *Soils, *Water flow, Moisture content, Slopes, Summer.

For abstract, see STAR 10 19.

N72-29298 PC$3.00/MF$0.95
Toronto Univ. (Ontario). Inst. of Environmental Sciences and Engineering.
REMOTE SENSING EVALUATION OF ENVIRONMENTAL FACTORS AFFECTING THE DEVELOPMENTAL CAPACITY OF INLAND LAKES.
S. J. Bird. 9 Feb 72, 20p REPT-1001180
Conf- Presented At 1st Can. Remote Sensing Symp., Ottawa, 9 Feb. 1972

Descriptors: *Canada, *Lakes, *Remote sensors, Aerial photography, Earth resources, Land use, Photointerpretation.

For abstract, see STAR 10 20.

PB-212 521 PC$3.00/MF$0.95
Illinois Univ., Urbana. Water Resources Center.
HYDRAULIC GEOMETRY AND LOW STREAMFLOW REGIMEN.
Final rept., 1 Jul 70-30 Jun 72,
John B. Stall, and Chih Ted Yang. Jul 72, 36p
WRC-RR-54
Prepared in cooperation with Illinois State Water Survey, Urbana.

Descriptors: (*River basins, *Stream flow), Water resources, Watersheds, Geometry, Illinois.
Identifiers: Hydraulic geometry.

Unit stream power is the time rate of potential energy expenditure per unit weight of water. In a stream it is regulated by the combined processes of meandering, forming pools and riffles, and carving a longitudinal stream bed profile. Sinuosity increases with stream order on the Kaskaskia River. Measurements on the Middle Fork Vermilion River shows that unit stream power is minimized by forming pools and riffles. Calculated dispersion coefficients in the Kaskaskia River basin increases with width-depth ratio. (Author).

PB-212 582 PC$3.00/MF$0.95
Wisconsin Univ., Madison. Water Resources Center.
DESTRATIFICATION OF LAKES BY SELECTIVE WITHDRAWAL METHODS.
Technical completion rept.,
Peter L. Monkmeyer, John A. Hoopes, and Juay C. Ho. 1972, 25p W73-00264, OWRR-A-046-WIS (1)
Contract DI-14-31-0001-3550

Descriptors: (*Lakes, Water quality), (*Reservoirs, Pumping), Mathematical models, Axisymmetric flow, Partial differential equations, Bottom water, Mixing, Numerical analysis.
Identifiers: *Destratification.

In the pilot study, mathematical models are developed to describe two-dimensional planar and three-dimensional axisymmetric withdrawal of a viscuous, non-diffusive density-stratified fluid from the bottom of a reservoir. The differential equations which describe the flow and include inertial effects are solved using the well known Karman integral technique. Analytical solutions of the two-dimensional planar model show that the growth of the withdrawal layer is proportional to the one-fourth power of the distance from the sink. This prediction agrees closely with laboratory experiments. The axisymmetric model predicts growth of the withdrawal layer proportional to the one-fourth power of the logarithm of the radial distance from the sink. Although no laboratory verification is available at this time, an experimental study of the axisymmetric model is under way. (Author)

PB-212 587 PC$3.00/MF$0.95
Oklahoma Water Resources Research Inst., Stillwater.
WATER RECLAMATION FOR GROUND WATER RECHARGE.
Final rept., Jul 71-Jun 72,
D. F. Kincannon, and W. G. Tiederman. Jun 72, 37p W73-00269, OWRR-A-034-OKLA (1)

Descriptors: (*Aquifers, Ground water recharge), (*Hydrocyclones, Experimental design), Water reclamation, Separation, Water treatment, Fluid infiltration, Efficiency, Statistical analysis.
Identifiers: Solid-liquid separation techniques, Water reuse.

The purpose was to develop solid-liquid separation techniques so that surface waters can be used to effectively recharge a ground water aquifer. Specifically, the research effort centered around the development of an efficient, low pressure drop 2 GPM hydrocyclone, the determination of the appropriate chemical treatment for clay-laden water when hydrocyclones are used, and infiltration studies with a laboratory aquifer. (Author)

PB-212 713 PC$3.00/MF$0.95
Colorado State Univ., Fort Collins. Environmental Resources Center.
BACTERIAL MOVEMENT THROUGH FRACTURED BEDROCK,
S. M. Morrison, and Martin J. Allen. Jul 72, 117p
Completion-32 W73-00943, OWRR-B-023-COLO (1)
Contract DI-14-01-0001-1882

Descriptors: (*Ground water, Water pollution), (*Water pollution, Bacteria), (*Bacteria, *Percolation), (*Sewage disposal, *Hydrogeology), (*Septic tanks, Water pollution), Subsurface drainage, Mountains, Water wells, Public health, Hydrology, Bacillus, Coliform bacteria, Water quality.
Identifiers: Geological joints, Bedrock.

Movement of bacteria-laden waters percolating through fractured bedrock was examined to determine whether effluent originating from conventional waste disposal systems could contaminate shallow ground water supplies. Inoculated waters were injected into holes and/or wells at two geologically different test sites to evaluate the extent of microbial filtration of leachfield effluent in or along bedrock fractures. Injection waters, inoculation with Bacillus stearothermophilis, were found to be readily transported by the ground water gradient into a downslope well. Continued bacteriological analysis showed the tracer bacterium to be present for at least 6 days after inoculation. At mountain building sites, it is essential that either hydrogeologic data, such as bedrock fracture patterns, depth and movement of ground waters, seasonal fluctuations in ground water levels, be fully ascertained prior to installation of waste disposal systems.

PB-212 718 PC$3.00/MF$0.95
South Dakota State Univ., Brookings. Water Resources Inst.
EFFECT OF DREDGING ON THE NUTRIENT LEVELS AND BIOLOGICAL POPULATIONS OF A LAKE.
Completion rept. 1 Jul 69-30 Jun 72,
Constance L. Churchill, and Clyde K. Brashier. Aug 72, 164p W73-00938, OWRR-B-013-SDAK (1)

Descriptors: (*Dredging, *Water quality), (*Limnology, Dredging), (*Lakes, Dredging), Water pollution, Nutrients, Food chains, Turbidity, Plankton, South Dakota, Algae, Cyanophyta, Chlorophyta, Inorganic phosphates, Biological surveys, Water chemistry, pH, Nitrogen, Phosphorus, Ecology.
Identifiers: *Eutrophication, Lake Herman.

Lake Herman, a shallow warm water prairie lake, has been monitored for chemical nutrients and planktonic algae before and during a dredging project. The major change in the lake with the commencement of dredging activity was a 300% increase in both ortho phosphate and total phosphorus. Calcium and total hardness decreased slightly and silica and turbidity were judged to have increased slightly. There were apparently no accompanying changes in planktonic algae, either in population densities or genera present. The silt and water removed with dredging was deposited in a low lying area near the lake, where the silt settled out and the water was returned to the lake. The water in this silt deposit area was also monitored. (Author)

8I. Mining Engineering

AD-750 713 PC$3.00/MF$0.95
Bureau of Mines Pittsburgh Pa Pittsburgh Mining and Safety Research Center
PHYSICAL PROPERTIES AND THE MECHANICS OF PENETRATION AND LOADING OF BULK MATERIALS AS RELATED TO RAPID EXCAVATION.
Annual technical rept. 1 Feb-31 Dec 71,
Kelvin K. Wu, and W. G. Pariseau. 1 Mar 72, 24p
Rept no. PMSRC-P96-2
ARPA Order-1579

Descriptors: (*Mining engineering, Earth-handling equipment), (*Rock (Geology), Mechanical properties), Shrinkage, Plasticity, Loading (Mechanics), Penetration, Particle size, Soil mechanics, Tensile properties, Test methods, Test equipment.
Identifiers: Rock excavation, Tunneling, Materials handling equipment, Rock mechanics.

Basic physical properties tests on 38 samples from tunneling and mining sites were completed. Designing and constructing a curved path penetration and loading apparatus has been accomplished. Linear penetration tests were run using both confined and unconfined materials. Confined tests were performed with bulk material in the loose state and then on a vibratory compacted state. Compaction was found to be the most important variable. Digging and loading tests indicated the tremendous energy required for the initial digging process compared to the loading process. Load cells were installed on the walls of the containers to measure the force transmitted to the walls during penetration tests. A finite element computer program was completed. (Author)

AD-750 724 PC$3.00/MF$0.95
Idaho Univ Moscow Bureau of Mining Research
COMPARATIVE STUDY OF SELECTED ROCK STRESS AND PROPERTY MEASUREMENT INSTRUMENTS.
Final technical rept. 2 Apr 71-30 Jun 72,
John R. Hoskins. Jun 72, 255p Rept no. UI-BMR-2
Contract H0210030, ARPA Order-1579

Descriptors: (*Rock (Geology), Stresses), (*Strain gages, Performance (Engineering)), (*Pressure gages, Performance (Engineering)), Deformation, Acceptability, Test methods, Sensitivity, Calibration, Costs.
Identifiers: *Rock mechanics.

The report presents information on selected stress and modulus gages designed to measure the deformation of a small hole drilled into rock, and the applied pressure in the case of modulus gages. The gages selected were the USBM Borehole Deformation Gage, the CSIR 'Doorstopper', and the Photoelastic Stressmeter (Glass Plug) to measure stresses; the Goodman Jack, the USBM Cylindrical Pressure Cell, the Menard Pressuremeter and the Borehole Dilatometer (Rocha) to measure rock modulus values. The information was gathered, initially by questionnaire and in greater depth by personal communication, from engineers who have used the instruments in the field. Information is provided on the use, cost, time, and other factors relating to the selected gages. The information is oriented towards comparative selection of gages to be used in specific applications. Information on problems likely to be encountered in the field is given. (Author)

PB-212 482 PC-GPO/MF$0.95-NTIS
Bureau of Mines, Washington, D.C.
ANALYSES OF NATURAL GASES, 1971.
Information circular,
L. E. Cardwell, and L. F. Benton. Sep 72, 168p BuMines-IC-8554
Prepared in cooperation with Helium Resources, Helium Operations, Amarillo, Tex. Paper copy available from GPO $1.75 as I28.27:8554.

Descriptors: (*Natural gas, Gas analysis), (*Helium, *Natural resources), Gas fields, Tables (Data).

The publication contains routine analyses and related source data for 475 natural gas samples from 17 States and two foreign countries. Of this total, 454 samples were collected during calendar year 1971. The other 21 samples were collected during previous years, but publication releases were not received until 1971. All samples were collected as a part of a continuous survey of the free world for occurrences of helium. (Author)

PB-212 504 PC-GPO/MF$0.95-NTIS
Bureau of Mines, Washington, D.C.
SULFUR COMPOUNDS IN CRUDE OIL.
Research bulletin,
H. T. Rall, C. J. Thompson, H. J. Coleman, and R. L. Hopkins. Sep 72, 195p BuMines-B-659
Prepared in cooperation with Bureau of Mines, Bartlesville, Okla. Bartlesville Energy Research Center.
Paper copy available from GPO $1.50 as stock no. SN-2401-8081.

Descriptors: (*Crude oil, *Sulfur organic compounds), Chemical analysis, Distillation, Chromatographic analysis, Gas chromatography, Solvent extraction, Infrared spectra, Ultraviolet spectra, Sulfur heterocyclic compounds, Mass spectra, Bibliographies.
Identifiers: Sulfur containing fuels.

The report summarizes a systematic 20-year study of the organic sulfur compounds in Wasson, Texas, crude oil and, to a lesser extent, of three other crude oils. It has culminated some 200 individual sulfur-compound identification techniques generally suitable for the characterization of sulfur compounds in any crude oil. The report cites early sulfur literature covering sulfur compound identifications completed before this study began and cites some 58 papers resulting from this work. The sulfur compounds in petroleum, both as to type and quantity, have long been of concern to the petroleum industry, and such compositional data are not only of theoretical interest, but also of practical value. The report contains a bibliography of 472 references. (Author)

PB-212 507 PC-GPO/MF$0.95-NTIS
Bureau of Mines, Washington, D.C.
DESIGNING BLAST PATTERNS USING EMPIRICAL FORMULAS. A COMPARISON OF CALCULATED PATTERNS WITH PLANS USED IN QUARRYING LIMESTONE AND DOLOMITE, WITH GEOLOGIC CONSIDERATIONS.
Information circular,
Joseph M. Pugliese. Sep 72, 39p BuMines-IC-8550
Prepared in cooperation with Bureau of Mines, Minneapolis, Minn. Twin Cities Mining Research Center.
Paper copy available from GPO $0.45 as stock no. SN-2404-1145, catalog no. I28.27:8550.

Descriptors: (*Blasting, *Quarrying), (*Mining engineering, Blasting), Empirical equations, Limestone, Dolomite (Rock), Explosive charges, Numerical analysis, Patterns, Design.

The work was done to provide quarry operators with an uncomplicated, first approximation method for designing blast patterns, considering geologic structure, and to show the valid use of the technique by comparing drill and blast pattern dimensions used in the quarry with those determined by the presented method. The author visited 12 limestone and dolomite quarries in Ohio (Adams, Crawford, and Highland Counties), Wisconsin (Milwaukee, Racine, and Waukesha Counties), and Minnesota (Fillmore, Olmsted, and Wabasha Counties); observed the blasting practices; studied the major geologic features; and after discussion with the quarry managers, foremen, and blasters, compared the quarry blasting patterns with those as calculated by the empirical formulae (after R.L. Ash), with geologic structural considerations. When geologic structure such as bedding, jointing, folding, and caves, as well as explosive properties and field performance characteristics are accounted for in a manner suggested by the research, the presented empirical formulae may be used as a good first approximation. (Author)

PB-212 556 PC-GPO/MF$0.95-NTIS
Bureau of Mines, Washington, D.C.
TRENDS IN THE MINERALS INDUSTRY, 1970.
Information circular.
Sep 72, 96p BuMines-IC-8547
Paper copy available from GPO $1.00 as stock no. 2404-1146 and I28.27:8547.

Descriptors: (*Mining, Trends), (*Minerals, Trends), (*Flotation, Trends), (*Metallurgy, Trends), Reviews, Fragmentation, Materials handling, Waste disposal, Beneficiation, Industries, Productivity.
Identifiers: *Minerals industries.

The Bureau of Mines annually publishes statistical data reflecting technological trends in the minerals industry (metals and nonmetals except fuels). The report outlines recent developments and trends and the technology outlook for mining practices and metallurgical processing based on a review of the minerals industry during the past 2 years. A historical statistical series which indicates trends in the minerals industry has been extended with 1970 data. In addition, data are given from a 5-year Bureau of Mines cyclic canvass of froth flotation plants. Data for 1970 are compared with those of 1960 and 1965. (Author)

PB-212 659 PC$3.00/MF$0.95
Bureau of Mines, Washington, D.C.
THE STATISTICAL AND SPATIAL EVALUATION OF SULFUR AND ASH IN COAL SEAMS.
Rept. of Investigations,
Manuel Gomez, Donald J. Donaven, and Kathleen Hazen. Sep 72, 51p BuMines-RI-7679
Prepared in cooperation with Bureau of Mines, Denver, Colo. Div. of Mine Systems Engineering.

Descriptors: (*Coal deposits, Statistical distributions), (*Sulfur, Coal deposits), (*Ash content, Coal deposits), Statistical samples, Forecasting, Pyrite.

The mean and the standard deviation were found useful to describe general sulfur and ash populations and specific populations of these variables from one coal seam. Both the mean and the standard deviation were incorporated in the exploration process to determine the number of drill cores necessary for seam evaluation and to guide the sequential drilling plan. Probability regions were computed to establish a basis for predicting probable ranges of average sulfur and ash concentrations that may be expected upon continued or future drilling. A computerized plot program was used to interpolate sulfur and ash concentrations between grid points. The plot program, which is essentially a moving average technique, permits a rapid evaluation of sulfur, sulfur forms, and ash spatial distributions as a drilling program progresses sequentially. (Author)

8J. Physical Oceanography

AD-750 679 PC$3.00/MF$0.95
Scripps Institution of Oceanography San Diego Calif Marine Physical Lab
PRELIMINARY CRUISE REPORT - IGUANA EXPEDITION.
Summary rept.,
George G. Shor, Jr., and Stuart M. Smith. 1 Oct 72, 35p Rept nos. SIO-Ref-72-76, MPL-U-65/72
Contract N00014-69-A-0200-6002, Grant NSF-GA-19703

Descriptors: (*Oceanographic data, Pacific Ocean), Oceanographic vessels, Oceanographic equipment, Marine geophysics, Ocean bottom topography, Magnetometers, Bathythermographs.
Identifiers: Seismic refraction, Iguana expedition, Bathymetry.

A preliminary cruise report of Expedition Iguana, 31 March 1972-11 May 1972, gives some preliminary results, list of equipment and, personnel, stations and data gathered, and track and topographic plots. (Author)

AD-750 714 PC$3.00/MF$0.95
Delaware Univ Newark Coll of Marine Studies
SEDIMENT DISTRIBUTION IN SOUTHWESTERN DELAWARE BAY.
Technical rept.,
Richard N. Strom. Jul 72, 125p Rept no. TR-18
Contract N00014-69-A-0407

Descriptors: (*Delaware Bay, *Sedimentation), Sampling, Classification, Particle size, Sand, Clay minerals, X-ray diffraction analysis, Silt, Maps, Ocean bottom sampling.
Identifiers: Bathymetry.

Upward and landward migration of sedimentary environments during the Holocene marine transgression has resulted in complex sediment distribution patterns in southwestern Delaware Bay. Analyses of 'thin-skin' surface samples using CM diagrams (Passega), sediment population analysis (Visher) and bathymetric relationships, indicate major processes contributing to the observed sedimentary distribution pattern: deposition from suspension in quiet water is occurring in Breakwater Harbor; well sorted sand deposits are being formed by the winnowing action of waves on top of the shoals in the open estuary in the northern portion of the study area; and strong tractive currents appear to be the dominant force controlling grain size distribution on The Shears, large shoal areas near the mouth of Delaware Bay. (Author)

AD-750 753 PC$3.00/MF$0.95
Saclant ASW Research Centre La Spezia (Italy)
OCEANOGRAPHY OF THE STRAIT OF SICILY.
Conference proceedings,
Thomas D. Allan, Tuncay Akal, and Robert Molcard. 15 Sep 72, 244p Rept no. SACLANTCEN-Conf-Proc-7
Proceedings of a Conference held at SACLANTCEN, La Spezia (Italy) 11-12 Apr 72. Errata sheet inserted. NATO furnished.

Descriptors: (*Oceanology, *Mediterranean Sea), Symposia, Ocean currents, Turbulence, Salinity, Deep water, Hydrographic surveying, Thermoclines, Marine geophysics, Marine geology, Gravity, Depth finding, Echo ranging, Plankton, Aquatic animals, Italy.
Identifiers: *Sicily Strait, Bathymetry.

Contents:
- The Strait of Sicily in relation to the general circulation of the Mediterranean;
- The hydrological characteristics of the waters exchanged between the eastern and the western basins of the Mediterranean;
- A study of the turbulent flow and character of the water masses over the Sicilian Ridge in both summer and winter;
- A summary of oceanographic data obtained in deep water in the Strait of Sicily in May 1970;
- A contribution to the hydrology of the Strait of Sicily;
- Preliminary results of current measurements in the Strait of Sicily in May 1970;
- The structure of fronts in the seasonal thermocline;
- The general geophysics and geology of the Strait of Sicily;
- Bathymetry, gravity and magnetism in the Strait of Sicily;
- The fauna of the Strait of Sicily;
- A contribution to the study of the surface and deep zooplankton in the Strait of Sicily.

AD-750 975 Reprint
Woods Hole Oceanographic Institution Mass
LONG RANGING BATHYMETRIC SURVEYING.
Technical rept.,
Robert C. Spindel, and James R. Heirtzler. Oct 72, 6p Rept nos. WHOI-72-78, WHOI-Contrib-2853
Contract N00014-70-C-0205
Availability: Pub. in Jnl. of the Acoustical Society of America, v34 p1936-1956 1962. (Ocean, p554-557 1972).

Descriptors: (*Ocean bottom topography, *Echo ranging), Underwater sound, Hydrophones, Charges (Explosive), Sonar equipment, Bahama Islands, Depth finding, Atlantic ocean.
Identifiers: *Bathymetric surveys, Side scanning sonar.

A long range acoustic side scan echo ranging system has been tested in the region east of the Bahama Islands and the Blake Plateau. The system employs a discrete, linear hydrophone array towed at an approximate depth of 600 m. Deep explosive charges fired at regular intervals serve as sound sources. Reflections were returned from the Bahama and Blake escarpments at ranges up to 370 km and can be correlated with known topographic relief. This ranging system test clearly shows the possibilities of making long range bathymetric surveys. (Author)

COM-72-11375 Reprint
Johns Hopkins Univ., Baltimore, Md. Chesapeake Bay Inst.
TIDAL VARIATION OF THE SIZE DISTRIBUTION OF SUSPENDED SEDIMENT AT A STATION IN THE CHESAPEAKE BAY TURBIDITY MAXIMUM,
J. R. Schubel. 1971, 17p Contrib-151 NOAA-72091998
Pub. in Netherlands Jnl. of Sea Research, v5 n2 p252-266 1971.

Descriptors: (*Suspended sediments, Particle size distribution), (*Chesapeake Bay, Suspended sediments), Tidal currents, Sedimentation, Turbidity, Beach erosion, Surface water runoff, Statistical data.

Results are presented of sedimentation size analyses of samples collected over a tidal cycle at a station within the turbidity maximum of Chesapeake Bay. (Author)

COM-72-11380 PC$3.00/MF$0.95
California Univ., San Diego, La Jolla. Inst. of Marine Resources.
TRACK CHARTS OF SIO BATHYMETRIC DATA AND TRACK CHARTS OF SIO MAGNETIC DATA IN THE PACIFIC OCEAN,
T. E. Chase, S. M. Smith, D. A. Newhouse, W. L. Crocker, and M. Schoenbechler. Feb 72, 91p IMR-TR-25 SIO-Sea Grant Pub-7, NOAA-72062903

Descriptors: (*Oceanographic data, *Pacific Ocean), Bathymetry, Magnetic surveys, Magnetic anomalies, Oceanographic charts.
Identifiers: Sea Grant Program.

The ocean is subdivided into 21 regions to facilitate location and data indexing. Data collected through 1971 are used; track lines are added to master indexes continuously. Instrumentation for data collection is identified. (Author)

N72-28341 PC$9.75/MF$0.95
Danish Meteorological Inst., Charlottenlund.
OCEANOGRAPHICAL OBSERVATIONS FROM DANISH LIGHT-VESSELS AND COASTAL STATIONS, 1971.
1972, 154p ISBN-87-7478-057-3
LANG- IN DANISH AND ENGLISH

Descriptors: *Denmark, *Oceanography, *Synoptic meteorology, Salinity, Tables (data), Water temperature, Water waves.

For abstract, see STAR 10 19.

N72-29116 PC$3.00/MF$0.95
Aerojet-general Corp., El Monte, Calif. Microwave Div.
A STUDY OF RADIOMETRIC EMISSION FROM A ROUGH SEA SURFACE.
Final Technical Report
A. Stogryn. Jul 72, 80p NASA-CR-2088, REPT-3000R-1
Contract NAS1-10633

Descriptors: *Microwave frequencies, *Ocean surface, *Radio emission, Electromagnetic radiation, Emissivity, Numerical analysis, Oceanography.

For abstract, see STAR 10 20.

N72-29300 PC$3.25/MF$0.95
Mcgill Univ., Montreal (Quebec). Arctic Meteorology Research Group.
EVALUATION OF NORTH WATER SPRING ICE COVER FROM SATELLITE PHOTOGRAPHS.
P. G. Aber, and E. Vowinckel. Jun 71, 25p PUBL-101
Contract DRBC-9511-107

Descriptors: *Bay ice, *Ice mapping, *Photointerpretation, *Satellite-borne photography, *Sea ice, Aerial photography, Canada, Distribution (property), Hydrography, Ice reporting, Meteorological satellites.

For abstract, see STAR 10 20.

N72-30349 PC$3.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MICROWAVE SIGNATURES OF FIRST-YEAR AND MULTIYEAR SEA ICE.
P. Gloersen, P. Nordberg, T. J. Schmugge, T. T. Wilheit, and W. J. Campbell. Aug 72, 22p NASA-TM-X-66006, X-652-72-312
Subm- Submitted for Publication

Descriptors: *Airborne equipment, *Microwave emission, *Remote sensors, *Sea ice, Arctic regions, Emissivity, Ground truth, Microwave radiometers.

For abstract, see STAR 10 21.

PB-212 488 PC$3.00/MF$0.95
Woods Hole Oceanographic Institution, Mass.
SEDIMENTS IN SURFACE WATERS OF THE EASTERN GULF OF GUINEA.
Technical rept. Jul 71-Jun 72,
Brian D. Bornhold, Jean R. Mascle, and Kenichi Harada. Sep 72, 31p WHOI-Ref-72-76, WHOI-Contrib-2948
Grant NSF-28193
Prepared in cooperation with Centre Oceanologique de Bretagne, Brest, France. Rept. no. Contrib-121.

Descriptors: (*Sea water, Suspended sediments), (*Suspended sediments, *Guinea Gulf), Ocean currents, Bed load, Salinity, Clay minerals, Sampling, Concentration (Composition), Sources, X ray diffraction.

Suspended sediments in the surface waters of the eastern Gulf of Guinea were studied in relation to sediment composition and source and the prevailing oceanic currents. Sediment-laden water is transported to the south of Fernando Poo into the Gulf in a southwesterly direction. The southeasterly flowing Guinea Current along the western edge of the Niger delta and the enormous sediment loads of the distributaries in this area contribute to a major lobe of suspended sediment off southwestern nose of the delta. Sediment concentration is inversely related to salinity in the northeastern Gulf; the relationship, however, is not linear as has been reported elsewhere. Sediment is also swept northward from the continental shelf off Gabon and the Congo Republic into the Gulf. Diatoms are the most abundant organic constituents with lesser amounts of organic aggregates and two varieties of fecal pellets. (Author)

PB-212 679 PC$3.00/MF$0.95
Coast Guard, Washington, D.C. Oceanographic Unit.
OCEANIC CONDITIONS OFF NORTHEASTERN BRAZIL FEBRUARY-MARCH AND OCTOBER-NOVEMBER 1966.
Oceanographic rept. no. 34,
Merton C. Ingham, and Robert B. Elder. Dec 70, 164p USCG-373-34

Descriptors: (*Oceanographic data, *Atlantic Ocean), (*Ocean currents, Atlantic Ocean), Salini-

ty, Depth finding, Temperature, Density (Mass/Volume), Sea water, Tables (Data), Coast guard research, Brazil.

Oceanic conditions in the upper 1800 meters of the water column off northeastern Brazil are described. The description is based on seven transects of oceanographic stations extending about 700 miles northeast from the coast. The presence of four major near-surface currents (North Brazilian Coastal Current, Equatorial Undercurrent, South Equatorial Current, and Equatorial Countercurrent) and two intermediate depth water masses (South Atlantic Central Water and Antarctic Intermediate Water) is discussed. Vertical sections of temperature, salinity, and density are included along with listings of the station data from which they were constructed. (Author)

PB-212 680 PC$3.00/MF$0.95
Coast Guard, Washington, D.C. Oceanographic Unit.
OCEANOGRAPHY OF THE MID-ATLANTIC BIGHT IN SUPPORT OF ICNAF (INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES).
Oceanographic rept. no. 35, Sep-Dec 67,
Vincent L. Whitcomb. Oct 70, 164p USCG-373-35

Descriptors: (*Oceanographic data, *Atlantic Ocean), Sea water, Temperature, Salinity, Density (Mass/Volume), Dissolved gases, Oxygen, Chlorophylls, Ocean currents, Fisheries, Continental shelves, Coast guard research.
Identifiers: *Mid Atlantic Bight, ICNAF (International Commission for the Northwest Atlantic Fisheries), International Commission for the Northwest Atlantic fisheries.

The physical oceanography of the shelf and slope waters of the Mid-Atlantic Bight (Cape Cod to Cape Hatteras) in September and December of 1967 is described. Temperature, salinity, density, dissolved oxygen, and chlorophyll data are presented in surface contours and section profiles. The seasonal cycle of temperature and salinity over the continental shelf is discussed and geostrophic currents in the slope water are inferred from the density structure. (Author)

PB-212 681 PC$3.00/MF$0.95
Coast Guard, Washington, D.C. Oceanographic Unit.
OCEANOGRAPHIC OBSERVATIONS ALONG THE EAST COAST OF THE UNITED STATES.
Oceanographic rept. no. 38, Jan-Dec 67,
Joseph Chase. Feb 71, 157p USCG-373-38

Descriptors: (*Oceanographic data, *Atlantic Ocean), Sea water, Temperature, Salinity, Diurnal variations, Oceanographic surveys, Tables (Data), Coast guard research, United States, Coasts.

Daily water temperatures and salinity observations for 1967 from 13 locations along the Atlantic seaboard are tabulated, plotted, and discussed. (Author)

PB-212 682 PC$6.00/MF$0.95
Coast Guard, Washington, D.C. Oceanographic Unit.
OCEANOGRAPHY OF THE GRAND BANKS REGION AND THE LABRADOR SEA.
Oceanographic rept. no. 39, Apr-Jun and Oct 68,
Henry S. Andersen, and Martin J. Moynihan. May 71, 326p USCG-373-39
Errata sheet inserted.

Descriptors: (*Oceanographic data, *Atlantic Ocean), Ocean currents, Sea ice, Temperature, Sea water, Salinity, Density (Mass/Volume), Newfoundland (Province), Tables (Data), Coast guard research.
Identifiers: *Grand Banks, *Labrador Sea.

In 1968, three cruises in operational support of the International Ice Patrol were conducted in April, May, and June off the Grand Banks of Newfoundland by the USCGC EVERGREEN. In addition, a section was occupied across the Labrador Sea from South Wolf Island, Labrador to Cape Farewell, Greenland by the USCGC EASTWIND in October 1968. The data obtained were used to draw temperature and salinity profiles, and to calculate surface dynamic topography and geostrophic velocity through the sections. Dynamic calculations were based on a reference level of 1000 decibars for the cruises in operational support of the International Ice Patrol and 1500 decibars for the Labrador Sea occupation. (Author)

PB-212 683 PC$3.00/MF$0.95
Coast Guard, Washington, D.C. Oceanographic Unit.
OCEANOGRAPHIC OBSERVATIONS IN KANE BASIN AND BAFFIN BAY.
Oceanographic rept. no. 44, May and Aug-Oct 69,
Martin J. Moynihan, and Robin D. Muench. Oct 71, 153p USCG-373-44

Descriptors: (*Oceanographic data, *Atlantic Ocean), (*Oceanographic surveys, *Arctic regions), Ocean currents, Sea ice, Temperature, Salinity, Deep water, Chemical composition, Sea water, Tables (Data), Coast Guard research, Canada.
Identifiers: *Baffin Bay, *Kane Basin.

Oceanographic conditions in Kane Basin during the spring and in northern Baffin Bay during the late summer and early fall of 1969 are described. Preliminary results of current meter measurements taken through the ice in Kane Basin are discussed. Vertical sections of temperature and salinity are presented and the relationship of these variables to Baffin Bay-North Water, Baffin Bay Deep Water and the general circulation of Baffin Bay is discussed. Analyses of isentropic diagrams and dynamic topography are also presented. Listings of physical and chemical station data are included. (Author)

8K. Seismology

AD-750 468 PC$3.00/MF$0.95
Alaska Univ College Geophysical Inst
CRUSTAL DEFORMATION PROPAGATION.
Final rept.,
Eduard Berg. Sep 72, 56p Rept no. UAG-R-222
AFOSR-TR-72-1977
Contract F44620-71-C-0105, ARPA Order-1827

Descriptors: (*Earthquakes, *Alaska), (*Structural geology, Seismic waves), Faults (Geology), Epicenter, Seismological stations, Propagation, Rayleigh waves.
Identifiers: ALPA (Alaskan Long Period Array), Alaskan long period array, Plate tectonics.

Tilt steps similar to strain steps have been observed for earthquakes with magnitudes ranging from 2 to 8 and distances ranging anywhere from 10 km to 12,600 kilometers. Tilt-step propagation velocities from the hypocenter to the station have been observed from 1.2 to 3.8 km/sec, and those corresponding to the arrival time of teleseismic S waves. Tilt directions, amplitudes and velocities observed at several stations simultaneously for the same earthquake are internally consistent and are likely to depend on the tectonic environment of the station in addition to the focal mechanism. The low velocity of 1.2 km/sec is consistent with a plastic wave propagation. Other velocities are close to the Rayleigh wave short-period group velocity over continental paths. (Author)

AD-750 479 PC$3.00/MF$0.95
California Inst of Tech Pasadena Div of Geological and Planetary Sciences
RESEARCH IN GEOPHYSICS.
Final rept. 1 Apr 62-31 May 72,
Stewart W. Smith, and David G. Harkrider. 31 May 72, 18p AFOSR-TR-72-1975
Grant AF-AFOSR-62-421

Descriptors: (*Seismology, Scientific research), Tides, Underground explosions, Nuclear explosions, Seismometers, Earthquakes, Seismic waves, Digital recording systems, Strain (Mechanics), Faults (Geology).
Identifiers: Acoustic gravity waves.

Research projects in a number of different branches of seismology are discussed. These include instrumentation, data processing, source studies, static fields, free oscillations, field observations, discriminates, fault slip, tectonic strain, earth tides, fluid injection, waves in layered media, acoustic gravity waves, spectral ratios, focal depth, magnitudes, atmospheric explosions and synthetic seismograms. Twenty six scientific papers and technical reports were published under this contract. The report gives a brief description and complete bibliography. (Author)

AD-750 769 PC$3.00/MF$0.95
Teledyne Geotech Alexandria Va Seismic Data Lab
APPLICATIONS OF THE JOINT EPICENTER DETERMINATION METHOD,
R. O. Ahner, R. R. Blandford, and R. H. Shumway. 25 Jun 71, 56p Rept no. SDL-275
Contract F33657-70-C-0941, ARPA Order-624

Descriptors: (*Earthquakes, Epicenter), (*Epicenter, Determination), Least squares method, Seismological stations, Networks, Corrections, Underground explosions, Nuclear explosions.
Identifiers: *Travel times.

Joint Epicenter Determination (JED), a least squares method of estimating earthquake epicenters and station corrections, is shown to be unstable for some teleseismic nets in that estimated locations and station corrections change substantially when a few readings from a large set are omitted. Locations are also shown to change if different travel-time tables are used. The result is established both for a North American and a world-wide net, using an epicentral region ranging 30 degrees along the Aleutian Islands. If the suite of epicenters were to be spread over the earth, a case not discussed in this study, JED may be stable. However, in that case it would apprear to be impossible, using JED, to discover the corrections to the average earth travel time tables caused by geology at the source or in the mantle. Thus JED could not be used to determine station corrections which would result in teleseismic locations accurate to 2-4 kilometers. (Author)

AD-750 776 Not available NTIS
Rand Corp Santa Monica Calif
GEOSCIENCES BULLETIN, SERIES A, VOLUME 3, NUMBER 1,
C. Shishkevish. Jan 72, 42p Rept no. R-1042/1-ARPA
Contract DAHC15-67-C-0141, ARPA Order-189-1
See also AD-748 625.
Availability: Paper copy available from RAND Corp., 1700 Main St., Santa Monica, Calif. 90406. $1.00.

Descriptors: (*Seismology, Abstracts), Reviews, Earthquakes, Microseisms, Echo ranging, Structural geology, Underground explosions, Nuclear explosions, Shock waves, Epicenter, Rayleigh waves, USSR.
Identifiers: Announcement bulletins.

Geosciences Bulletin, Series A, consists of abstracts, annotations, translations, book reviews, and analytical surveys of current Soviet and East European open-source scientific literature related to the detection of underground nuclear explosions. Subjects covered include seismology crustal and upper mantle investigations, static high-pres-

sure and shock wave research, and underground nuclear explosions. (Author)

N72-28343 PC$29.25/MF$0.95
New Zealand. Dept. of Scientific and Industrial Research, Wellington. Geophysics Div.
NEW ZEALAND SEISMOLOGICAL REPORT, 1967.
Seismological Observatory Bulletin
1972, 542P E-149

Descriptors: *Earthquakes, *New zealand, *Seismic waves, Seismic energy, Tables (data).

For abstract, see STAR 10 19.

PB-212 602 PC$3.00/MF$0.95
California Inst. of Tech., Pasadena. Earthquake Engineering Research Lab.
ANALYSES OF STRONG MOTION EARTHQUAKE ACCELEROGRAMS. VOLUME III. RESPONSE SPECTRA. PART A. ACCELEROGRAMS IIA001 THROUGH IIA020,
A. G. Brady, D. E. Hudson, and M. D. Trifunac.
Aug 72, 278p EERL-72-80
Grant NSF-GK-28098X
See also Volume 2, Part A dated Sep 71, PB-208 283 and Volume 4, Part A, PB-212 603.

Descriptors: (*Earthquakes, Data processing), (*Seismic waves, Spectrum analysis), (*Dynamic structural analysis, Buildings), Accelerometers, Digital recording, Power spectra, Dynamic response, Degrees of freedom, Velocity measurement, Tables (Data), California.
Identifiers: Earthquake engineering.

The report is the first volume of a series presenting earthquake response spectrum curves calculated from corrected ground accelerograms. An introduction summarizes response spectrum techniques in earthquake engineering as a background to the use of the data. For each earthquake accelerogram, two spectrum plots are given - relative velocity response versus period on a linear scale, and a tripartite log-log plot giving relative displacement, pseudo-velocity, and pseudo-acceleration spectra. The Fourier spectrum plot is also shown on the linear plot. Digital printouts of ordinates of the plotted curves are tabulated for each earthquake. The earthquakes in part A match the uncorrected accelerogram data of volume I and the corrected accelerogram data of volume II. (Author)

PB-212 603 PC$3.00/MF$0.95
California Inst. of Tech., Pasadena. Earthquake Engineering Research Lab.
ANALYSES OF STRONG MOTION EARTHQUAKE ACCELEROGRAMS. VOLUME IV. FOURIER AMPLITUDE SPECTRA. PART A. ACCELEROGRAMS IIA001 THROUGH IIA020,
Firdaus E. Udwadia, A. Vijayaraghavan, D. E. Hudson, A. Gerald Brady, and Mihailo D. Trifunac. Aug 72, 170p EERL-72-100
Grant NSF-GK-28098
See also Volume 3, Part A dated Aug 72, PB-212 602.

Descriptors: (*Earthquakes, Data processing), (*Seismic waves, Spectrum analysis), (*Dynamic structural analysis, Buildings), Accelerometers, Digital recording, Power spectra, Fourier analysis, Dynamic response.
Identifiers: Earthquake engineering, Ground motion.

The report is the first volume of a series presenting Fourier amplitude spectra for earthquake ground motions and for structural response accelerations. An introduction summarizes Fourier spectrum techniques in earthquake engineering as a background to the use of the data. For each earthquake accelerogram, two spectrum plots are given - a Fourier amplitude spectrum versus frequency on a linear scale, and a log-spectrum, log-frequency plot. In the series, Fourier amplitude spectra will be given for all corrected accelerograms, including building response measurements. For buildings for which simultaneous basement and upper floor accelerograms are available, building transfer functions are also plotted. The earthquakes in Volume IV, Part A, match the uncorrected accelerogram data of Volume I, the corrected accelerogram data of Volume II, and the response spectrum plots of Volume III. (Author)

PB-212 604 PC$3.00/MF$0.95
Virginia Polytechnic Inst. and State Univ., Blacksburg. Water Resources Research Center.
SOME SEISMIC MEASUREMENTS ON THE VIRGINIA COSTAL PLAIN,
John K. Costain, and Edwin S. Robinson. Sep 72, 79p VPI-WRRC-Bull-56 W73-00543, OWRR-A-034-VA (3)

Descriptors: (*Seismic prospecting, Data reduction), (*Sediments, Thickness), (*Virginia, Sediments), Seismic reflection method, Seismic refraction method, Spectra.
Identifiers: *Seismograms.

Seismic reflection and refraction surveys were made on the eastern coastal plain of the United States near Franklin and Boykins, Virginia, to investigate the thickness of the coastal plain sediments. Seismic reflection data indicated a total thickness of 990 feet near Franklin, and 575 feet near Boykins. Seismic reflections from the base of the unconsolidated sedimentary section were well-recorded at both locations. Computer analysis of the reflection data revealed additional reflections from within the sedimentary section which were not clearly evident on the field records. (Author)

8L. Snow, Ice, and Permafrost

AD-750 596 PC$3.00/MF$0.95
Cold Regions Research and Engineering Lab Hanover N H
NOTES ON A THERMAL PROBE FOR MEASURING THE TEMPERATURE OF ICE LAYERS (REMARQUE SUR UNE SONDE THERMIQUE POUR MESURER LA TEMPERATURE DES COUCHES DE GLACE),
Karl Philberth. Oct 72, 7p Rept no. CRREL-TL365
Draft trans. of Academie des Sciences, Paris. Comptes Rendus (France) v255 n22 p3022-3024 1962.

Descriptors: (*Glaciers, Temperature), (*Temperature sensitive elements, Design), Ice, Thermal properties, Thermometers, France.
Identifiers: Translations.

When a thermal probe is thrust down into ice, it disturbs the ambient temperature. In order to measure the original temperature only 1 hour after such heating, a special device is suggested: the thermometer is placed in the point of a bar below the head of the probe. (Author)

AD-750 744 MF$0.95
Naval Oceanographic Office Washington D C
REPORT OF THE ARCTIC ICE OBSERVING AND FORECASTING PROGRAM - 1970.
Special publication.
Jan 72, 250p Rept no. NOO-SP-70 (70)
See also report dated Aug 70, AD-877 739.
Availability: Available in microfiche only.

Descriptors: (*Sea ice, *Arctic regions), (*Aerial reconnaissance, Sea ice), Roughness, Thickness, Melting, Freezing, Icebreakers, Surface properties, Meteorological satellites, Cloud cover.
Identifiers: *Birds Eye Project, *Ice forecasting, Spaceborne photography.

The report contains a summary of Naval Oceanographic Office and Naval Weather Service ice operations during 1970. Describes operational aspects of obtaining and disseminating ice information and the ice forecasting and observing program. Ice charts including Danish data depict observed synoptic ice conditions throughout the year. Ice conditions interpreted from satellite photographs are included separately. Locations of oceanographic stations occupied in the polar and subpolar regions are included. (Author)

8M. Soil Mechanics

AD-750 572 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
MOVEMENT OF VARIABLE-DENSITY INCLUSIONS IN WET SAND UNDER BLAST LOADING.
Final rept.,
Edward B. Perry. Sep 72, 63p Rept no. AEWES-Misc-Paper-S-72-37

Descriptors: (*Sand, Explosion effects), (*Soil mechanics, Sand), Loading (Mechanics), Airburst, Stability, Foundations (Structures), Test methods.
Identifiers: Liquefaction.

The purpose of the study was to determine, for the cases of laboratory one-dimensional plane wave loading of a wet sand specimen and the combined airblast and ground-shock loading that occurs in wet sandfilled test pits in an HE field test, the effect of inclusion mass variation on their residual movements, and to infer from these determinations the effect of relative density, position of free-water surface, and surface membrane on the potential for liquefaction of wet sand under blast loading.

AD-750 597 PC$3.25/MF$0.95
Cold Regions Research and Engineering Lab Hanover N H
METHOD OF PREDICTING THE STRENGTH PARAMETERS OF ROADBED OF SILTY SOILS IN REGIONS I AND II OR ROAD-CLIMATIC ZONES WITH AID OF A COMPUTER (METODIKA PROGNOZIROVANIYA PROCHNOSTNYKH KHARAKTERISTIK ZEMLYANOGO POLOTNA IZ PYLEVATYKH GRUNTOV V RAYONAKH I I II DOROZHNOGO-KLIMATICHESKIKH ZON S PONOSHCHYU EVM),
I. A. Zolotar. Oct 72, 22p Rept no. CRREL-DL366
Draft trans. of Trudy Pyatogo Sovesbchaniya-seminara po Obmenu Opytom Stroitelstva v Surovykh Klimaticheskikh Uslovihakh (Transactions of Fifth Conference-Seminar on Exchange of Construction Experience under Severe Climatic Conditions), Materials of Section on Road-Transport Construction, vol 7, no 1, Krasnoyarsk, 1968 p21-38 (sic).

Descriptors: (*Soil mechanics, Mathematical models), (*Roads, Design), (*Permafrost, Soils), Foundations (Structures), Freezing, Melting, Moisture, Flexural strength, Deformation, Silt, Sand, USSR.
Identifiers: Translations, Cold weather construction, Frozen soils, Computer aided analysis.

In planning and building the main transport trunk roads in regions I and II of the road-climatic zone, it is necessary to solve the question concerning applying the local cohesive soils for building a roadbed. To facilitate the evaluation of these soils (silty sandy loams and silty loams) and in planning the road designs, the author's method was converted to an algorithm, and was programmed and solved on the Ural-4 computer for more than 150 points in the USSR territory. The adoption of the computer into the planning of road designs in the regions of permafrost and severe climate will favor the formulation of planning the highways on a higher scientific level. (Author)

AD-750 598 PC$3.00/MF$0.95
Cold Regions Research and Engineering Lab Hanover N H

ESTIMATION OF HEIGHT AND SETTLEMENT OF FILL PLANNED IN PERMAFROST ZONE ASSUMING THAWING OF SOIL BASE (RASCHET VYSOTY I OSADKI NASYPI, PROEKTIRUEMOI S DOPUSHENIEM OTTAIVANIYA GRUNTOV OSNOVANIYA),
A. A. Malyshev, and B. I. Popov. Oct 72, 19p Rept no. CRREL-TL367
Draft trans. of Trudy Pyatogo Soveshchaniya-Seminara po Obmenu Opytom Stroitelstva v Surovykh Klimaticheskikh Usloviyakh (Transactions of 5th Conference Seminar on Exchange of Construction Experience under Severe Climatic Conditions) Tyumen 1968. vol 7, no 1, Materials of Section on Road-Transport Construction, Krasnoyarsk, 1968, p63-85 (sic).

Descriptors: (*Soil mechanics, *Permafrost), (*Roads, Construction), Moisture, Ice, Freezing, Melting, Thickness, Tables, USSR.
Identifiers: Translations, Frozen soils, Settlement (Structure).

The authors make the following conclusions: The stability of road structures in the permafrost zone depends on the carrying capacity of the base soils which is determined by the degree of their settlement. Settlement of soils depends on the type of moistness (ice content) of the soil. The schematic charts for the settlement of base soils provides a basis for selecting a principle for planning the road structures, specifying the height of fill and choosing the preliminary calculation of the scales of earth-moving operations. Selection of the method for estimating the final settling depends on the extent of moistness in the base soils, the presence or absence of mossy-vegetative interstratification, time of performing the work, and type of soils in the base. (Author)

AD-750 599 PC$3.00/MF$0.95
Cold Regions Research and Engineering Lab Hanover N H
CALCULATING THE STRENGTH OF ROAD STRUCTURES UNDER PERMAFROST CONDITIONS IN THE FIRST ROAD-CLIMATIC ZONE (RASCHET PROCHNOSTI DOROZHNYKH KONSTRUKTSII V USLOVIYAKH MERZLOTY V PERVOI DOROZHNO-KLIMATICHESKOI ZONE),
N. A. Puzakov, and V. A. Davydov. Oct 72, 13p Rept no. CRREL-TL368
Draft trans. of Trudy Pyatogo Soveshchaniya-Seminara po Obmenu Opytom Stroitelstva v Surovykh Klimaticheskikh Ulslovihah (Transactions of Fifth Conference--Seminar on Exchange of Construction Experience under Severe Climatic Conditions) Tyumen, Oct 1968. Materials of Section on Road-Transport Construction, vol 7, no 1, Efficient Planning of Highways and Railroads in Zone of Permafrost and Severe Climate, Krasnoyarsk, 1968, p86-98 (sic).

Descriptors: (*Soil mechanics, *Permafrost), (*Roads, Construction), Foundations (Structures), Mathematical prediction, Deformation, Thickness, Melting, Flexural strength, Clay, Silt, Strain (Mechanics), Sand, USSR.
Identifiers: Translations, Frozen soils.

The authors recommend that the calculation of the strength of a road structure functioning under permafrost conditions be performed in the following sequence: Determine the thickness of the thawing soil with preliminary designation of a specific depth of covering; Establish the required strength of the structure, proceeding from the tolerable overall (SAURSRI method) or the elastic (MAHI method) deformation and load; and, Refine by calculation the depth of covering assuring the strength needed.

AD-750 600 PC$3.00/MF$0.95
Cold Regions Research and Engineering Lab Hanover N H
EFFECT OF GROUND WATER ON STABILITY OF SLOPES AND STRUCTURES ERECTED ON THEM ON THAWING OF FROZEN SOILS (VLIYANIE GRUNTOVYKH VOD NA USTOICHIVOST SKLONOV I VOZVEDENNYKH NA NIKH SOORUZHENII PRI OTTAIVANII MERZLYKH GRUNTOV),
V. S. Savelev. Oct 72, 13p Rept no. CRREL-TL369
Draft trans. of Trudy Pyatogo Soveshchaniya-seminara po Obmenu Opytom Stroitelstva v Surovykh Klimaticheskikh Usloviyakh (Transactions of 5th Conference-Seminar on Exchange of Construction Experience under Severe Climatic Conditions), Tyumen, 1968, vol 7, no 1, Efficient Planning of Highways and Railroads in Zone of Permafrost and Severe Climate, Krasnoyarsk, 1968, p207-219 (sic).

Descriptors: (*Soil mechanics, Water), (*Foundations (Structures), Stability), (*Permafrost, Soils), Moisture, Deformation, Terrain, Melting, Rainfall, Ice, Silt, Sand, Clay, USSR.
Identifiers: Translations, *Frozen soils, Ground water, Slope stability.

The stability of soil masses is determined by their filtration qualities and specific conditions of slope flooding caused by the freeze-thaw cycles. The stability of the seasonally thawed layer on the slopes formed of silty sands and sandy loams is usually disrupted during prolonged rains. The loams and clays start to move even without atmospheric precipitation, owing to the ground water forming during thawing of interbeddings of segregated ice. Here the typical conditions for the stability of wet soils lying on the surface of frozen ground are examined. (Author)

AD-750 648 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE CALCULATIONS OF TWO COMPRESSIBILITY MECHANISMS IN EQUATIONS OF SOIL DYNAMICS,
G. M. Lyakhov, and N. I. Polyakova. 1 Sep 72, 19p Rept no. FTD-HT-23-749-72
Edited trans. of Materialy Vsesoyuznogo Simpoziuma po Rasprostraneniyu Uprugo-Plasticheskikh Voln v Sploshnykh Sredakh, n.p., n.d. (Material of the All-Union Symposium on the Propagation of Elastoplastic Waves in Solids) n.p., 1964 p234-244, by Ray E. Zarza.

Descriptors: (*Soil mechanics, Compressive properties), Mathematical analysis, Particles, Deformation, Pressure, Moisture, Structural properties, USSR.
Identifiers: Translations.

A system of equations is proposed which determines the unidirectional movement of the soil with the simultaneous calculation of its compressibility as a three-component medium and also as the compressibility of the soil skeleton. The soil characteristics and the values of the pressures at which it is necessary to calculate both compressibility mechanisms were determined experimentally. (Author)

N72-28138 PC$3.25/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
BIOLOGICAL REDUCTION OF MINERAL PHOSPHATES.
K. I. Rudakov. Jul 72, 22p NASA-TT-F-14411
Contract NASW-2035
Tran- Transl. Into English From Zentr. Bakteriol., V. 70, No. 2, 1927 P 202-214

Descriptors: *Biochemistry, *Phosphorus oxides, *Reduction (chemistry), *Soils, Chemical reactions, Microorganisms, Phosphates, Tables (data).

For abstract, see STAR 10 19.

N72-28336 PC$3.00/MF$0.95
Techtran Corp., Glen Burnie, Md.
COMPARISON OF SOIL TEMPERATURE DATA OBTAINED FROM DIFFERENT KINDS OF SOIL.
L. Olah. Jun 72, 11p NASA-TT-F-14287
Contract NASW-2037
Tran- Transl. Into English From Orszagos Meteorologiai Intezet, Hivatalos Kiadv. (Hungary), V. 25, 1962 P 96-101

Descriptors: *Soils, *Temperature measurement, Annual variations, Heating, Moisture content, Vegetation.

For abstract, see STAR 10 19.

N72-28347 PC$3.75/MF$0.95
George Washington Univ., Washington, D.C.
PLANNING AND PROGRAMING IN THE SOIL CONSERVATION SERVICE.
R. M. Gray. Jun 72, 30p NASA-CR-127436, GWPS-MON-13
Contract NGL-09-010-030
Conf- Presented At Seminar No. 3 of An Evening Ser. on Technol. Assessment Methodology, Washington, D. C., 18 May 1972

Descriptors: *Conservation, *Earth resources, *Soils, Cost analysis, Management.

For abstract, see STAR 10 19.

N72-28349 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
A NEW METHOD FOR THE SOIL MOISTURE MEASUREMENT (MOMINS METHOD).
J. Kubo. Jul 72, 9p NASA-TT-F-14394
Contract NASW-2035
Tran- Transl. Into English From Agr. Meteorol. (Japan), V. 8, 1953 P 108-110

Descriptors: *Moisture content, *Soils, *Thermal conductivity, Sampling.

For abstract, see STAR 10 19.

N72-28351 PC$3.00/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
METHOD OF CALCULATING SOIL TEMPERATURE AT A DEPTH OF 5 CM FROM ATMOSPHERIC TEMPERATURE AND HUMIDITY VALUES.
L. V. Popovich. Aug 72, 12p NASA-TT-F-14516
Contract NASW-2038
Tran- Transl. Into English From Tr. Nauchn-issled. Gidrometeorologicheskogo Inst. (Kiev), No. 91, 1970 P 89-98

Descriptors: *Soil science, *Statistical analysis, *Temperature profiles, Annual variations, Atmospheric moisture, Atmospheric temperature, Diurnal variations, Earth resources.

For abstract, see STAR 10 19.

N72-28356 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
THERMAL PROPERTIES OF THE SOIL AS A FUNCTION OF ITS MOISTURE AND COMPACTNESS.
A. I. Gupalo. Jul 72, 13p NASA-TT-F-14364
Contract NASW-2035
Tran- Transl. Into English From Pochvovedenie (Moscow), No. 4, Apr. 1959 P 40-45

Descriptors: *Conductive heat transfer, *Soils, *Specific heat, *U.S.S.R., Moisture content, Void ratio.

For abstract, see STAR 10 19.

N72-29432 PC$3.75/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

DIELECTRIC CONSTANTS OF SOILS AT MICROWAVE FREQUENCIES.
F. E. Geiger, and D. Williams. Apr 72, 34p
NASA-TM-X-65987, X-652-72-283

Descriptors: *Dielectric properties, *Microwave radiometers, *Soil science, Earth resources, Electrical properties, Moisture content, Remote sensors.

For abstract, see STAR 10 20.

N72-29434 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
TEMPERATURE CHANGES IN THE GROUND.
O. Reya. Aug 72, 11p NASA-TT-F-14502
Contract NASW-2035
Tran- Transl. Into English From Drustvo Meteorologov Slovenije, Meteoroloski Zbornik (Yugoslavia), No. 1, 1957 P 92-100

Descriptors: *Earth crust, *Temperature measurement, *Yugoslavia, Soils, Surface temperature.

For abstract, see STAR 10 20.

N72-30337 PC$3.00/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
THE TEMPERATURE OF IRRIGATED SOIL.
J. Pletser. Aug 72, 4p NASA-TT-F-14500
Contract NASW-2038
Tran- Transl. Into English From Idojaras (Budapest), V. 64, No. 2, Mar. - Apr. 1960 P 113-114

Descriptors: *Irrigation, *Soils, *Surface temperature, *Thermistors, Conductive heat transfer, Hungary, Moisture content.

For abstract, see STAR 10 21.

N72-30338 PC$3.00/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
METHOD FOR DETERMINATION OF THE HEAT FLUX IN SOIL AND ITS APPLICATION TO FIELD MEASUREMENTS.
E. T. Kiss. Aug 72, 10p NASA-TT-F-14501
Contract NASW-2038
Tran- Transl. Into English From Idojaras (Budapest), V. 64, No. 6, 1960 P365-371

Descriptors: *Heat balance, *Heat flux, *Physical properties, *Soils, Hungary, Surface temperature, Thermal conductivity.

For abstract, see STAR 10 21.

N72-30339 PC$3.00/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
TEMPERATURE OF GRASSY AND ROLLED SOILS.
Z. H. Varga. Aug 72, 5p NASA-TT-F-14512
Contract NASW-2038
Tran- Transl. Into English From Idojaras (Budapest), V. 67, No. 3, May - Jun. 1963 P 178-179

Descriptors: *Soils, *Surface temperature, *Temperature measurement, Diurnal variations, Weather stations.

For abstract, see STAR 10 21.

N72-30353 PC$7.25/MF$0.95
Massachusetts Inst. of Tech., Cambridge. School of Engineering.
FINITE ELEMENT ANALYSIS OF ELASTO--PLASTIC SOILS. REPORT NO. 4 FINITE ELEMENT ANALYSIS OF ELASTO-PLASTIC FRICTIONAL MATERIALS FOR APPLICATION TO LUNAR EARTH SCIENCES.
W. A. Marr, Jr. Jun 72, 103p NASA-CR-128529, SOILS-PUBL-301
Contract NAS9-9990

Descriptors: *Finite element method, *Soils, *Stress-strain diagrams, Nonlinearity, Strain hardening, Tensile stress.

For abstract, see STAR 10 21.

PB-212 605 PC$3.00/MF$0.95
Texas Tech Univ., Lubbock. Water Resources Center.
THE MINERALOGY AND CHEMISTRY OF HIGH PLAINS PLAYA LAKE SOILS AND SEDIMENTS.
Completion rept.
B. L. Allen, Billy L. Harris, Kenneth R. Davis, and Glen B. Miller. Jul 72, 84p WRC-72-4 W73-00544, OWRR-B-004-TEX (2)
Contract DI-14-01-0001-1551

Descriptors: (*Minerology, Playas), (*Playas, Soil properties), Sediments, Clays, Silts, Sands, Chemical properties, Texture, Drainage, Particle size distribution, Aquifers, Ground water recharge, Texas, New Mexico.

Ubiquitous shallow depressions, locally called playas, dot the southern High Plains of West Texas and eastern New Mexico. They range in size from a fraction of an acre to more than 200 acres. The playas hold water intermittently and have no external drainage. The primary objectives of the study were to characterize the mineralogy of a playa soil and underlying sediments from each of the soil textural zones, to determine selected chemical and physical properties of the soils from the same playas, and to determine the relationships of the playa sediments to the associated upland soils. (Author)

8N. Terrestrial Magnetism

N72-28340 PC$5.00/MF$0.95
Danish Meteorological Inst., Charlottenlund.
GODHAVN GEOPHYSICAL OBSERVATORY MAGNETIC RESULTS, 1965.
1972, 60p ISBN-87-7478-044-1

Descriptors: *Denmark, *Magnetic surveys, Formulas (mathematics), Magnetometers, Tables (data).

For abstract, see STAR 10 19.

N72-28342 PC$4.25/MF$0.95
Danish Meteorological Inst., Charlottenlund.
RUDE SKOV GEOPHYSICAL OBSERVATORY MAGNETIC RESULTS, 1968.
A. Hansen. 1972, 44p ISBN-87-7478-056-5

Descriptors: *Denmark, *Magnetic surveys, Magnetic fields, Perturbation, Rail transportation, Tables (data).

For abstract, see STAR 10 19.

N72-28344 PC$5.00/MF$0.95
Ludwig-maximilians-universitat, Munich (West Germany). Fakultaet Fuer Geowissenschaften.
OBSERVATIONAL RESULTS FROM THE GEOMAGNETIC OBSERVATORY FUERSTENFELDBRUCK FOR THE YEAR 1971 . ERGEBNISSE DER BEOBACHTUNGEN AM ERDMAGNETISCHEN OBSERVATORIUM FUERSTENFELDBRUCK IM JAHRE 1971.
1972, 60p SER-A-NR-14

Descriptors: *Earth tides, *Geomagnetic pulsations, *Magnetic fields, *Magnetic measurement, Geophysical observatories, Germany, Magnetic surveys, Tables (data).

For abstract, see STAR 10 19.

N72-29279 PC$3.25/MF$0.95
Grambling Coll., La. Dept. of Physics.
FREQUENCY DEPENDENCE OF ATS-1 OBSERVED MICROPULSATIONS ON SOME GEOPHYSICAL PARAMETERS.
Semiannual Status Report
W. D. Cummings, F. Mason, and P. J. Coleman, Jr. 8 Jun 72, 21p NASA-CR-127801
Contracts NGR-19-011-007, NGL-05-007-004
Conf- Presented At 53d Ann. Meeting of the Am. Geophys. Union, 19 Apr. 1972

Descriptors: *Ats 1, *Low frequencies, *Oscillations, Magnetic fields, Magnetometers, Synchronous satellites.

For abstract, see STAR 10 20.

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-750 317 PC$3.00/MF$0.95
Army Electronics Technology and Devices Lab Fort Monmouth N J
MILLIMETER WAVE QUASI-OPTICAL TECHNIQUES FOR DEVICE AND CIRCUIT FUNCTIONS,
Metro Chrepta, and Harold Jacobs. 1972, 14p

Descriptors: (*Waveguides, Semiconductors), (*Integrated circuits, Extremely high frequency), Millimeter waves, Semiconductor devices, Silicon, Dielectrics.

The concept of high resistivity semiconductor waveguides offers the following: Low transmission loss for radiation over large regions of the spectrum; Low cost, since guides can be machined and polished from the outside rather than from the inside, and have flexibility in construction; Design of devices in the propagating medium; and, because transmission is in a relatively high dielectric, the energy is transmitted in an oversized guide mode, and broader bandwidths are possible. (Author)

AD-750 338 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
RARE EARTH COBALT PERMANENT MAGNET MATERIALS FOR ELECTROMECHANICAL ENERGY CONVERSION DEVICES,
G. Lafrate, R. L. Ross, F. Rothwarf, and C. Campagnoulo. 1972, 15p

Descriptors: (*Magnets, *Cobalt alloys), (*Electromechanical converters, Magnets), Praseodymium, Samarium, Cerium alloys, Intermetallic compounds, Permanent magnet generators, Radiofrequency filters, Limiters.
Identifiers: *Cobalt samarium, *Cobalt cerium, *Cobalt intermetallics, Samarium intermetallics, Cerium intermetallics, Praseodymium intermetallics, *Permanent magnets.

In the past few years, considerable research has been conducted on binary and ternary alloy systems of the 3d transition elements with metals of the rare-earth group (elements with nuclear charge 21, 39 and 57 through 71). These studies have revealed many new ferro- and ferrimagnetic substances. The most impressive of these new alloys are those based on the hexagonal intermetallic cobalt rare-earth (RE) compounds Co5RE. In this paper, the authors present new designs which use these materials in the development of a compact electronically tunable high field dc magnet for use in microwave filters and power limiters as well as in the design of power generators for use in artillery fuzing applications.

AD-750 364 PC$3.00/MF$0.95
Army Electronics Command Fort Belvoir Va Night Vision Lab

MEASUREMENT OF THE ANGULAR DISTRIBUTION OF PHOTOELECTRONS FROM THIRD GENERATION PHOTOCATHODE MATERIALS,
John H. Pollard. 1972, 14p

Descriptors: (*Semiconductor devices, Photocathodes), (*Photocathodes, Photoelectric effect), (*Image intensifiers (Electronics), Photocathodes), Gallium arsenides, Infrared radiation, Mathematical models.

The experimental measurements of the angular distribution of photoemitted electrons from cesium-oxygen activated p-type GaAs surfaces shows a highly directional photoemission approximately independent of the surface orientation. The mathematical model explaining these observations shows the expected Lambertian distribution is modulated by a strong exponential function resulting from the attainment of negative electron affinity conditions.

AD-750 374 PC$3.00/MF$0.95
Frankford Arsenal Philadelphia Pa
APPLICATION OF IMAGE UP-CONVERSION TO NIGHT FIRE CONTROL,
Joseph A. Schmitz. 1972, 14p

Descriptors: (*Image intensifiers (Electronics), Reliability (Electronics)), (*Night warfare, *Fire control systems), Crystals, Birefringence, Optical scanning, Semiconductor devices, Multiplex, Lasers, Low-intensity illumination.
Identifiers: FLIR (Forward Looking Infrared), Forward looking infrared, Signal processing.

Reports such as the U.S. Army ENSURE 78 RVN evaluation of the AN/AAQ-5 FLIR under actual combat conditions attest to the potential of far infrared imaging devices, in detecting, acquiring, and identifying targets at extended ranges. These systems, however, are not without their drawbacks; in particular, for the airborne case, their huge size and weight restricted aircraft performance and load carrying capacity; equipment and parts costs were high, unique operating environments were required for the FLIR detectors, and the systems proved to be unreliable and difficult to maintain. It was clear that more R and D would be required before lightweight, low cost and dependable FLIR systems could be fielded. Problems lead to the continued search for improvements in system concepts, designs and materials. Parametric Image-Up-Conversion is one such system concept which has recently generated considerable interest and, potentially, may prove to be a viable technique for developing an infrared imaging system free from many of the problems associated with FLIR. (Author)

AD-750 393 PC$3.00/MF$0.95
Army Electronics Technology and Devices Lab Fort Monmouth N J
NEW CLASS OF MATERIALS FOR HIGH ENERGY STORAGE APPLICATIONS FROM CRYSTALLIZATION OF INORGANIC DIELECTRIC GLASSES UNDER PRESSURE,
Robert J. Zeto, E. Hryckowian, and Charles D. Bosco. 1972, 10p

Descriptors: (*Capacitors, *Dielectrics), (*Glass, Dielectrics), Niobates, Pressure, Glass capacitors, Lasers, Military requirements, Dielectric properties.
Identifiers: *Devitrified glass.

The objective was to develop an alternative type of capacitor material by using a hydrostatic pressure technique to improve the dielectric properties of an inorganic niobate glass/ceramic. As a result of the basic research that was conducted with this technique, the dielectric properties were improved to such an extent that the resultant energy storage surpassed that of state-of-the-art organic capacitors and satisfied current military requirements for high energy storage for laser applications. (Author)

AD-750 467 PC$3.00/MF$0.95
Hebrew Univ Jerusalem (Israel)
RADIATION EFFECTS ON QUARTZ CRYSTALS AND OSCILLATORS, AND GROWTH OF DOPED QUARTZ CRYSTALS.
Final rept. 1 Jan 69-31 Dec 71,
A. Halperin, M. Schieber, A. A. Braner, J. Levinson, and D. Zloto. May 72, 62p AFCRL-72-0506
Contract F61052-69-C-0015

Descriptors: (*Quartz resonators, *Radiation damage), (*Quartz, *Crystal growth), Doping, Heat of activation, Frequency shift, Thermoluminescence, Electric currents, Electron bombardment, Israel.

Quartz crystals containing V (5+), Ga (3+), Mg (2+), Ge (4+) and Zn (2+) were grown. Kinetics of growth, segregation of the impurities and mechanical Q values of the crystals were investigated. Electron probe analysis has revealed in the grown crystals circular defects, some 2 - 15 microns in diameter. All investigated impurities were found to concentrate preferentially in these defects. Preliminary results have shown comparatively higher Q-values in Zn (2+) containing crystals. Radiation effects were investigated in various natural and synthetic resonators, before and after sweeping-in various monovalent ions. Thermoluminescence and thermally stimulated currents in the irradiated crystals were examined and a possible correlation between these properties and the piezoelectric properties was indicated.

AD-750 535 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE DESIGN OF A CAPACITOR BATTERY WITH AN ENERGY RESERVE OF 625 KJ FOR PRODUCING POWERFUL MAGNETIC FIELDS,
S. M. Fertik, E. G. Taller, V. V. Konotop, V. Ya. Linetskii, and V. S. Gladkov. 25 Aug 72, 17p Rept no. FTD-MT-24-896-72
Edited machine trans. of mono Magnitnye Lovushki (Magnetic Traps) Kiev, 1965 p137-146, by Joseph E. Pearson.

Descriptors: (*Capacitors, *Power supplies), Capacitance, Inductance, Magnetic fields, Circuits, USSR.
Identifiers: *Capacitor banks, Translations.

The article describes the design and final construction of a capacitor bank rated 625 kJ and intended to operate at four different charging voltages (50, 100, 200, and 250 kv), with such larger operating life than earlier designs (not less than 200,000 discharges as against 2000-5000) and with low total inductance. The main stages of the development consisted of designing a special capacitor (type KIMS-1) rated 10 microfarads (12.5 kJ), and a special system of interconnecting and switching the capacitor bank, consisting of special discharge gaps and various high-voltage coaxial cables. Problems involved in stacking the capacitors into columns, mechanical strength and safety during discharge are also discussed. (Author)

AD-750 576 PC$6.00/MF$06.00
Hughes Aircraft Co Culver City Calif Electronic Properties Information Center
LIGHT-EMITTING DIODES FOR LASER PUMPING.
Interim rept.,
Harvey V. Winston. Jul 72, 35p* Rept no. EPIC-IR-80
Contract DSA900-72-C-1182

Descriptors: (*Diodes (Semiconductor), Electroluminescence), (*Lasers, Pumping (Optical)), Gallium arsenides, Phosphides, Aluminum compounds, Density, Crystal structure, Thermal properties, Electrical properties, Optical properties, Band theory of solids.
Identifiers: *Light emitting diodes, Aluminum arsenides, Gallium phosphides, YAG lasers, Neodymium lasers.

The report reviews the published literature on the application of lightemitting diodes to the pumping of solid-state laser rods. Because of the requirements of matching the LED output to the absorption bands of the active laser impurity ions, most work in this field has concentrated on the ternary alloy LED's such as gallium aluminum arsenide and gallium arsenic phosphide systems. Data tables on these materials are appended to the report. (Author)

AD-750 577 PC$6.00/MF$06.00
Hughes Aircraft Co Culver City Calif Electronic Properties Information Center
MATERIALS AND INTERFACE FACTORS LIMITING LSI (LARGE SCALE INTEGRATED CIRCUITS) PERFORMANCE AND RELIABILITY.
Interim rept.,
Thomas C. Hall, Robert H. Boschan, and William G. Brammer. Aug 72, 45p* Rept no. EPIC-IR-81
Contract DSA900-72-C-1182

Descriptors: (*Integrated circuits, Reliability (Electronics)), Semiconductor devices, Manufacturing methods, Electrical properties, Mechanical properties, Electrochemistry, Stress corrosion.
Identifiers: Large scale integrated circuits.

Material, chemical, physical, metallurgical and electrical effects in large scale integreated circuits (LSI) and other semiconductor devices are surveyed. Material transport phenomena, thermochemical and electrochemical effects, properties of metallization systems for semiconductor devices and semiconductor surface effects as they affect device performance and reliability are discussed. Eighty-nine references are provided. (Author)

AD-750 611 PC$3.00/MF$0.95
RCA Labs Princeton N J
OPTOELECTRONIC ELECTRON EMITTER.
Semiannual rept. 1 Jan-30 Jun 72,
Horst E. Schade, Henry Kressel, and Harry F. Lockwood. Oct 72, 28p Rept no. PRRL-72-CR-40 ECOM-0059-3
Contract DAAB07-71-C-0059, ARPA Order-1686
See also AD-741 348.

Descriptors: (*Photocathodes, Semiconductor devices), Gallium arsenides, Electroluminescence, Diodes (Semiconductor), Band theory of solids, Work functions, Emissivity.
Identifiers: *Cold cathodes, *Optoelectronic electron emitters, Electron emission.

The electron energy distribution of a semiconductor cold-cathode based on negative electron affinity was measured. The half-width of the energy distribution of electrons, emitted from a GaAs- (Al-Ga)As structure, was found to be 160 meV which is distinctly narrower than that for a conventional thermionic cathode. The measured half-width is in fair agreement with calculations that take into account energy losses suffered by the electrons in the space-charge region below the surface. (Author)

AD-750 612 PC$3.00/MF$0.95
Stanford Univ Calif Microwave Lab
ACOUSTIC SURFACE WAVE RESEARCH.
Semiannual rept. no. 2, 1 Sep 71-31 Mar 72,
M. Chodorow, H. J. Shaw, G. S. Kino, L. A. Coldren, and W. R. Shreve. May 72, 48p Rept no. ML-2090 ECOM-0145-2
Contract DAAB07-71-C-0145
See also AD-738 836.

Descriptors: (*Delay lines, Ultrahigh frequency), Semiconducting films, Transducers, Parametric amplifiers, Thin film storage devices, Manufacturing methods, Indium antimonides, Bismuth compounds, Germanium compounds, Oxides, Lithium compounds, Niobates, Silver, Waveguides.
Identifiers: Signal processing, *Acoustic surface waves, Acoustic delay lines, Surface waves, Lithium niobates, Germanium oxides, Bismuth oxides.

Waveguiding has been observed at 50 MHz in a thin silver strip of 15 mil width vacuum deposited on a bismuth germanium oxide substrate and operating as an electric-field shorting guide. Waveguiding is demonstrated by the elimination of diffraction loss. Waveguiding was also demonstrated in an indium antimonide thin film surface wave amplifier, using a film width of 1 mil operating as an electric-field shorting guide at 340 MHz. This amplifier is suitable for use together with metal film guides of the above type. Wrap-around metal film guides will be constructed to measure propagation loss in these guides, for experimental evaluation of the prospects for using the amplifiers for compensating propagation loss in waveguide systems for very long time delay. A 20 microsecond balanced phase delay line was demonstrated in which the 6 dB bi-directional insertion loss of ordinary two-port delay lines was eliminated. (Author)

AD-750 642 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
PROTECTION OF COMMUNICATION CABLES IN PLASTIC SHEATHS FROM LIGHTNING STRIKES,
S. A. Sokolov, V. K. Orlov, and B. K. Goryunov.
4 Aug 72, 16p Rept no. FTD-MT-24-41-72
Edited machine trans. of Elektrichestvo (USSR) n4 p80-83 1969, by Charles T. Ostertag, Jr.

Descriptors: (*Transmission lines, Shielding), Electric insulation, Plastic coatings, Metal coatings, Effectiveness, Lightning, USSR.
Identifiers: *Sheathing, *Sheaths, Translations.

From impulse generator tests on a cable 4 km in length (a one-quarter cable with polythene-insulated cores, an aluminum foil screen in the form of a two-layer winding of steel wires each 0.25 mm in diameter; enclosed in P.V.C. cover; outside diameter of cable of the order 15 mm), it was found that protection by earthing the cable screen along the line is generally less effective than protection by laying a lighting conductor of bimetal 0.25-0.35 m deep, although cost considerations and local conditions may influence the choice in particular cases.

AD-750 775 PC$3.00/MF$0.95
Rochester Univ N Y Dept of Electrical Engineering
JOSEPHSON FREQUENCY CONVERSION IN SUPERCONDUCTING POINT-CONTACT JUNCTIONS.
Doctoral thesis,
Andrew Longacre, Jr. Oct 72, 121p
Contract N00014-67-A-0398-0003

Descriptors: (*Frequency multipliers, Microwave frequency), (*Superconductors, Frequency multipliers), Superconductivity, Submillimeter waves, Cryogenics, Experimental design, Theses.
Identifiers: *Josephson junctions, Analog simulation.

The term 'Josephson frequency conversion' refers to a mode of operating the Josephson junction wherein it acts as both the local oscillator and mixer in a form of heterodyne conversion. This thesis presents both experimental and analytical results arising from the demonstration and study of that frequency-converting property in superconducting point-contact junctions. (Author)

AD-750 960 PC$3.00/MF$0.95
Westinghouse Electric Corp Baltimore Md Systems Development Div
BINARY-ADDRESSABLE SCAN CONVERSION STORAGE TUBE.
Quarterly rept. no. 3, 15 Apr-14 Jul 72,
Jon W. Ogland, Haden J. Bourg, and Igor Limansky. Oct 72, 33p ECOM-0052-3
Contract DAAB07-72-C-0052
See also AD-744 796.

Descriptors: (*Storage tubes, Design), Electron tube parts, Manufacturing methods, Reliability (Electronics).

The objective of the contract is to conduct a research and development program leading to the fabrication, testing and delivery of a binary-addressable scan-converter storage-tube. The tube is to be capable of simultaneous write and non-destructive read operation at video frequency up to 10 megahertz. Both the read and write gun assemblies (with spares) were completed and tested for conformance with specifications. The various components of the digitizer-unit were fabricated, and the refractory insulators were ordered from companies specializing in close tolerance grinding of such materials. The silicon wafers were prepared with the precision notches for indexing, and were annealed, oxidized, and metalized. The masks for photoresist-controlled etching of the electrode-patterns were completed. A precision laser-drilling and machining facility was acquired, installed and checked out.

AD-750 969 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
CALULATION OF THE DISTIRBUTION OF PULSE VOLTAGE IN A NETWORK OF SERIES-CONNECTED SEMICONDUCTOR RECTIFIERS,
M. N. Novikov, I. D. Pashentsev, and V. A. Zavyalov. 11 Aug 72, 15p Rept no. FTD-MT-24-46-72
Edited machine trans. of Institut Inzhenerov Zheleznodorozhnogo Transporta, Leningrad. Sbornik Trudov (USSR) n293 p29-38 1969, by Charles T. Ostertag, Jr.

Descriptors: (*Rectifiers, Semiconductor devices), Silicon, Voltage, Networks, USSR.
Identifiers: Translations.

In this article results are presented from a theoretical analysis of the distribution of pulse voltage over a circuit of series-connected gates of the type VK2-200 which do not have shielding elements. A comparison of the results of the calculation and test data is carried out.

AD-751 019 PC$3.00/MF$0.95
Naval Research Lab Washington D C
A FORTRAN SUBROUTINE FOR PLOTTING A SMITH CHART.
Interim rept.,
John R. Brinson. Oct 72, 22p Rept no. NRL-MR-2517

Descriptors: (*Transmission lines, Electrical impedance), (*Computer programs, Instruction manuals), Subroutines, Plotters, Waveguides, Microwave frequency.
Identifiers: FORTRAN, *Smith chart, SMCCHART computer program.

Computer determined waveguide or transmission line parameters can now be shown on a Smith Chart plotted by the subroutine described in the report, saving tedious and time-consuming manual plotting. Also included is a subroutine, ADMTPLT, which selects the data to be plotted on the Smith Chart. All control for the plotting of the charts and the data to be plotted is implemented in the main program. The effect of varying one parameter in the computation of data may be investigated by plotting more than one set of data on each chart. Appendix A shows the development of the algorithms for plotting the Smith Chart, and Appendix B shows the FORTRAN subroutine in a demonstration program. A sample plot is shown. (Author)

NTIS-PK-130 PC$20.00
National Technical Information Service, Springfield, Va.

LIGHT EMITTING DIODES - SELECTED ABSTRACTS.
Rept. for Jan 64-Oct 72,
William R. Ryerson. Nov 72, 89p*

Descriptors: (*Semiconductor diodes, *Bibliographies), (*Photodiodes, Bibliographies), Abstracts, Electroluminescence, Semiconductor lasers, Gallium arsenides, Gallium phosphides, Lead tellurides, Tin tellurides.
Identifiers: *Light emitting diodes.

The NTISearch Information Package (NTIS-PK) contains 88 selected abstracts of research reports retrieved using the NTIS on-line bibliographic search system - NTISearch. This information package contains abstracts on light emitting diodes, including studies about gallium arsenides and phosphides, lead and tin tellurides, and various phenomena of electroluminescence. (Author)

N72-28226 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
APOLLO 14 MISSION CIRCUIT BREAKER ANOMALY.
Anomaly Report No. 4
Dec 71, 5p NASA-TM-X-68391, MSC-05814

Descriptors: *Apollo 14 flight, *Circuit breakers, Breadboard models, Failure analysis.

For abstract, see STAR 10 19.

PAT-APPL266832 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ELECTRON BEAM CONTROLLER.
Patent Application
H. G. Kosmahl. Filed 27 Jun 72, 11p
NASA-CASE-LEW-11617-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Electron beams, *Focusing, *Magnetic fields, *Microwave oscillators, Electron tubes, Magnetic control, Magnetic effects, Patent applications.

A method and apparatus for refocusing a spent electron beam before it is injected into a collector to achieve maximum efficiency is reported. Such an arrangement is particularly advantageous in a microwave electron tube. Provided are magnetic fields of selected intensities for refocusing and stabilizing the electron beam over axial lengths which have a predetermined relationship to the wavelength of operation.

N72-28228 PC$9.00/MF$0.95
Columbia Univ., New York. Faculty of Pure Science.
CURRENT CONDUCTION IN JUNCTION GATE FIELD EFFECT TRANSISTORS.
Ph.D. Thesis
C. Kim. 1970, 137p NASA-CR-127481
Contracts NGR-33-008-090, NSF GK-1550

Descriptors: *Electrical resistivity, *Field effect transistors, *Transport properties, Electric current, Gates (circuits), Junction transistors, Semiconductor devices.

For abstract, see STAR 10 19.

N72-28230 PC$3.00/MF$0.95
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
PROCEDURE FOR POTTING ELECTRICAL CABLE ASSEMBLY TERMINATIONS.
H. F. Williams. 5 May 72, 11p
NASA-TM-X-68690, KSC-GP-896

Descriptors: *Cleaning, *Electric terminals, *Potting compounds, *Power lines, Cables, Manuals, Safety.

For abstract, see STAR 10 19.

N72-28242 PC$4.25/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Research Inst. of Technology.
CIRCUIT MODEL FOR CHARACTERIZING THE NEARLY LINEAR BEHAVIOR OF AVALANCHE DIODES IN AMPLIFIER CIRCUITS.
Semiannual Status Report, 16 Aug. 1971 - 15 Feb. 1972
P. Penfield, Jr., D. F. Peterson, and D. H. Steinbrecher. 15 Feb 72, 45p NASA-CR-122507
Contracts NGL-22-009-337, DAAB07-71-C-0300

Descriptors: *Amplifier design, *Avalanche diodes, *Circuit diagrams, *Electrical properties, *Nonlinear systems, Electrical measurement, Intermodulation, Logic circuits.

For abstract, see STAR 10 19.

N72-28685 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE DIMINIODE A RESEARCH AND DEVELOPMENT TOOL FOR NUCLEAR THERMIONICS.
J. F. Morris. Aug 72, 17p NASA-TM-X-2586, E-6862

Descriptors: *Cesium diodes, *Performance, *Thermionic power generation, Computer techniques, Cost analysis, Reactor technology, Research and development.

For abstract, see STAR 10 19.

N72-28693 PC$7.25/MF$0.95
Electrotechnical Lab., Tokyo (Japan).
RESEARCHES ON SUPERCONDUCTING MAGNET.
S. Shimamoto. Dec 70, 101p RR-722
LANG- IN JAPANESE ENGLISH SUMMARY

Descriptors: *Magnetic coils, *Structural design, *Superconducting magnets, Electrical properties, Magnetic fields, Magnetic properties.

For abstract, see STAR 10 19.

N72-29033 PC$3.25/MF$0.95
Techtran Corp., Glen Burnie, Md.
PHASE-BOUNDARY IMPEDANCE OF NOBLE METAL ELECTRODES IN THE REGION OF HYDROGEN ADSORPTION. 1 ACTIVATED PLATINUM ELECTRODES.
M. Breiter, H. Kammermaier, and C. A. Knorr. Aug 72, 25p NASA-TT-F-14365
Contract NASW-2037
Tran- Transl. Into English From Z. Elektrochem (Weinheim, West Ger.), V. 60, No. 1, 1956 P 37-47

Descriptors: *Adsorption, *Electrodes, *Platinum, Electric current, Hydrogen, Impedance, Linearity.

For abstract, see STAR 10 20.

N72-29173 PC$3.75/MF$0.95
Princeton Univ. Observatory, N.J.
DEVELOPMENT OF TELEVISION TUBES FOR THE LARGE SPACE TELESCOPE.
J. L. Lowrance, and P. Zucchino. 1971, 35p NASA-CR-127794
Contracts NSR-31-001-127, NGR-31-001-236
Conf- Presented At Intern. Conf. on Space Applications of Camera Tubes, Paris, 23-25 Nov. 1971

Descriptors: *Astronomy, *Spaceborne telescopes, *Television equipment, Imagery, Photocathodes, Spectrometers, Vidicons.

For abstract, see STAR 10 20.

N72-29682 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EMITTER SURFACE TEMPERATURE DISTRIBUTION FOR A MINIATURE THERMIONIC DIODE.
R. B. Lancashire, E. J. Manista, J. F. Morris, and A. L. Smith. Aug 72, 6p NASA-TM-X-2588, E-6961

Descriptors: *Brightness temperature, *Hohlraums, *Temperature distribution, *Thermionic emitters, Surface properties, Thermionic diodes.

For abstract, see STAR 10 20.

N72-30497 PC$5.25/MF$0.95
Thermo Electron Corp., Waltham, Mass.
DEVELOPMENT AND FABRICATION OF INSULATOR SEALS FOR THERMIONIC DIODES.
Final Report
V. L. Poirier. Jun 72, 64p NASA-CR-128021, TE5257-1-73
Contracts NAS7-100, JPL-953179
Subm- Prepared for Jpl

Descriptors: *Cermets, *Seals (stoppers), *Thermionic diodes, Aluminum compounds, Bonding, Niobium, Oxides, Yttrium compounds, Zirconium.

For abstract, see STAR 10 21.

N72-30601 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DIMINIODE PERFORMANCE DATA WITH AN ASTAR-811C EMITTER AND A NIOBIUM - 1--PERCENT-ZIRCONIUM COLLECTOR.
A. L. Smith, R. B. Lancashire, E. J. Manista, and J. F. Morris. Sep 72, 16p NASA-TM-X-2587, E-6962

Descriptors: *Miniature electronic equipment, *Performance tests, *Thermionic diodes, Computer techniques, Electronic equipment tests, Niobium alloys, Tantalum alloys, Zirconium alloys.

For abstract, see STAR 10 21.

N72-30743 PC$3.00/MF$0.95
Monsanto Research Corp., St. Louis, Mo.
DEVELOPMENT OF HIGH TEMPERATURE GALLIUM PHOSPHIDE RECTIFIERS.
M. G. Craford, and D. L. Keune. Sep 72, 57p NASA-CR-2098
Contract NAS3-14387

Descriptors: *Gallium phosphides, *High temperature environments, *Rectifiers, *Systems engineering, Epitaxy, Performance, Semiconductor devices.

For abstract, see STAR 10 21.

9B. Computers

AD-750 408 PC$3.00/MF$0.95
Illinois Univ Urbana Coordinated Science Lab
HIGH DENSITY OPTICAL MEMORY.
Quarterly progress rept. Jul-Sep 72,
H. W. Knoebel, and H. V. Krone. Oct 72, 4p
Contract N00014-67-A-0305-0015

Descriptors: (*Data storage systems, Optical equipment), (*Computer storage devices, Feasibility studies), Gas lasers, Ultraviolet radiation, Resolution, Performance (Engineering).

Identifiers: Optical crystal memories, *Optical storage devices, Acoustooptic interactions, Ultraviolet lasers, Krypton lasers, Ion lasers.

The maximum information packing density on the memory crystal is determined by the f number and quality of the optical system. The optical system is a multi-element system including lenses, a polarization control cell, and a beam deflector. Each of these elements can cause aberration and distortion of the beam cross section. During this quarter, a study was made of the optical system to determine where the most severe resolution limitations occur.

AD-750 435 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
PERMANENT STORAGE OF THE 'DNEPR-2' COMPUTER SYSTEM,
A. M. Seligei, and D. S. Trostyanetskii. 4 Aug 72, 11p Rept no. FTD-MT-24-177-72
Edited machine trans. of Mekhanizatsiya i Avtomatizatsiya Uprevleniya (USSR) n3 p31-32 1970, by Henry Peck.

Descriptors: (*Computer storage devices, Design), Data storage systems, Digital computers, USSR.
Identifiers: Translations, DNEPR 2 computers, Read only storage.

An independent permanent storage of the transformer type of the Dnepr-2 computer system is described which collects octal data and outputs it in binary. (Author)

AD-750 475 PC$3.00/MF$0.95
Air Force Cambridge Research Labs L G Hanscom Field Mass
IMAGE ANALYSIS FACILITY: AN INTERACTIVE DIGITAL COMPUTER SYSTEM.
Physical sciences research papers,
Arthur P. Ginsburg, Floyd H. Cook, and John C. Mott-Smith. 23 May 72, 121p Rept nos. AFCRL-72-0338, AFCRL-PSRP-496

Descriptors: (*Data processing systems, *Photographic images), Television cameras, Input-output devices, Data storage systems, Programming (Computers).
Identifiers: *Image processing, PDP 1 computers.

The Image Analysis Facility (IAF) is a special-purpose digital computer system incorporating custom hardware and software that has been developing at the AFCRL Data Sciences Laboratory for over 10 years. The IAF is designed to provide highly flexible, on-line interactive processing of pictorial information that includes capabilities that are unique to a non-batch computer system. The IAF system hardware and software sections are broken down functionally and are fully discussed. Over 40 photographs illustrating selected program effects on pictures are presented. (Author)

AD-750 503 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
AN ASYCHRONOUS CONTROL SYSTEM FOR BINARY SUMMATORS,
V. A. Ramanauskas. 4 Aug 72, 10p Rept no. FTD-HT-23-259-72
Edited trans. of Politekhnicheskii Institut, Kaunas (USSR). Vychislitelnaya Tekhnika, v1 p161-164 1970, by Henry Peck.

Descriptors: (*Logic circuits, Control systems), Synchronization (Electronics), Computer logic, Binary arithmetic, Special functions (Mathematical), USSR.
Identifiers: Translations, Asychronus computers, Boolean functions, Adding circuits.

A method of constructing an asynchronous control system for binary summators based on analyzing the values of the addend bits is examined. The

speed and losses of the apparatus for summators constructed by the proposed method are determined. (Author)

AD-750 509 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
CRT MULTICHANNEL DIGITAL-DISPLAY DEVICE,
K. I. Didenko, I. S. Shandrin, and A. N. Konarev.
25 Aug 72, 11p Rept no. FTD-HT-23-963-72
Edited trans. of Pribory i Sistemy Upravleniya (USSR) n3 p9-10 1971, by Henry Peck.

Descriptors: (*Input-output devices, Cathode ray tube screens), Digital systems, Cathode ray tubes, Control systems, USSR.
Identifiers: Translations.

The operating principles and structural design of a device for multichannel digital display on cathode ray tubes are presented. The device has 64 channels, a recording cycle time on 1 channel of 0.01 seconds, maximum distance of the displays from the electronic circuitry 15 meters, number of indexed decimal digits 4, and a distance of clear perception of data with illumination of no more than 50 lux of five meters. It uses the 5L038 cathode ray tube. A symbolic schematic of encoding numbers by segments, the time diagram of the segment codes and the block diagram of the device are given. (Author)

AD-750 510 PC$3.00/MF$0.95
Purdue Univ Lafayette Ind School of Electrical Engineering
DESIGN OF THRESHOLD ELEMENTS USING A POLYNOMIAL-THRESHOLD APPROACH,
M. H. Loew, and K. S. Fu. 1972, 13p AFOSR-TR-72-2010
Grant AF-AFOSR-1776-69

Descriptors: (*Pattern recognition, Algorithms), Polynomials, Matrix algebra, Mapping (Transformations), Set theory, Graphics.
Identifiers: Nonparametric pattern recognition, Graph theory.

A method is presented which reduced the number of thresholds required by a multi-threshold threshold element to realize a function of a nonbinary variable, as would arise in certain nonparametric pattern-recognition techniques. Polynomials (often of only first- or second-degree) replace selected thresholds, and predetermined bounds enable the designer to determine in advance the value of the trade. Illustrative examples are presented and discussed. (Author)

AD-750 512 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE ORGANIZATION OF THE PARALLEL OPERATION OF PERIPHERAL EQUIPMENT USING AN ASSOCIATIVE STORAGE,
L. S. Levinskii. 25 Aug 72, 14p Rept no. FTD-HT-23-1135-72
Edited trans. of Nauchno-Tekhnicheskaya Informatsiya. Seriya I: Organizatsiya i Metodika Informatsionnoi Raboty (USSR) n7 p30-32 1971, by Henry Peck.

Descriptors: (*Computer storage devices, Input-output devices), Logic circuits, Performance (Engineering), USSR.
Identifiers: Translations, Associative storage, Auxiliary equipment (Computers).

A page organized buffer memory is used for a simultaneous functioning of many input output units connected to a central computer system. The main features are given on the storage device with a built in logic functioning as the dispatching unit in operations with pages, as developed at VINITI. (Author)

AD-750 538 PC$3.00/MF$0.95
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
STILL ANOTHER TOOL FOR SYNCHRONIZING COOPERATING PROCESSES,
P. L. Woden. Aug 72, 17p AFOSR-TR-72-2002
Contract F44620-70-C-0107

Descriptors: (*Programming (Computers), Scheduling), Programming languages, Set theory, Algorithms.
Identifiers: Semaphores, Parallel programming, ALGOL 68 programming languages, ALGOL, Synchronism, Coordination.

The paper outlines a synchronizing tool which, for some applications, is more convenient than the usual semaphore to obtain transparent programs and easy correctness proofs. The expressive power and the implementation of this new semaphore are briefly discussed. (Author)

AD-750 605 PC$3.00/MF$0.95
Army Mobility Equipment Research and Development Center Fort Belvoir Va
SOURCE TEXT EDITOR FOR THE VARIAN DATA 620.
Research rept. Jul 71-Jan 72,
Melvin L. Goss. Aug 72, 75p* Rept no.
USAMERDC-2033

Descriptors: (*Computer programs, Instruction manuals), Magnetic tape, Corrections.
Identifiers: Varian Data 620 computers, *Editing routines, Paper tape, FORTRAN, FORTRAN 4 programming language, Assembly languages.

A source text editor program for application on the Varian Data 620 in the computer-aided design and engineering facility was developed to provide the user with a convenient method for Generation of a source paper tape for input to an assembler or FORTRAN IV compiler; Correction and modification of sources text tapes through keyboard control from the teletypewriter or equivalent CRT terminal device and the high-speed paper tape system; Listing sources text teletypewriter printer; Reading and writing source text data to Linetape magnetic tape files; Manipulation of data in small data base files with such possible applications as system files directories, maintenance assistance and general teaching aid for the computer-aided design and engineering facility; and Preparation of source data file for input to DAS assembler. The source text editor uses the Linetape magnetic tape system manufactured by Computer Operations, Inc., as data files. Special loader and utility subroutines, in addition to the source text editor, were provided with assembly language program listings. (Author)

AD-750 613 PC$3.00/MF$0.95
Control Data Corp Rockville Md Ocr Operations
ADVANCED DEVELOPMENT MODEL (FEASIBILITY TYPE) TACTICAL PAGE READER.
Semiannual rept. no. 2, 1 Dec 71-31 May 72,
William Fischer, and Sidney Greenwald. Oct 72, 47p ECOM-0255-2
Contract DAAB07-71-C-0255
See also AD-740 879.

Descriptors: (*Reading machines, Design), Character recognition, Optical scanning, Optical equipment, Printed circuits, Feasibility studies, Photodiodes.
Identifiers: *Optical character recognition device.

The report describes work done and progress made during the second six months of the design and fabrication of the advanced model (feasibility type) Tactical Page Reader. The logic of the reader down to gate details and integrated circuit types is virtually complete. Additional tests and measurements were made on 256 bit self-scanning photodiode arrays. Eleven different types of printed circuit boards were designed. All special circuits for the machine were designed. These include amplifier and quantizing circuits for the scanning arrays, lamp servo amplifier for illumination control, as well as others. A new scanning array and lens mount assembly was designed. The layout for the keyboard and control panel of the reader is complete.

AD-750 639 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
CONTROL PROGRAM OF SOFTWARE OF THE MODEL M-1000 COMPUTER SYSTEM,
E. I. Khonelidze, B. Z. Guraspashvili, and L. D. Devidze. 25 Aug 72, 9p Rept no. FTD-HC-23-0970-72
Unedited rough draft trans. of Nauchn. Konferentsee Molodykh Issledovatslei po Sistemotekhn (4th) Kiev. Materialy (Scientific Conference of Young Researchers on Systems Technology (4th) Kiev. Materials) v2 1969 p19-22 (sic).

Descriptors: (*Programming (Computers), Instruction manuals), USSR.
Identifiers: M1000 computer system, *Monitor routines, Translations.

The control program (monitor) for the software of the M-1000 is described. The main functions of the monitor are: interpretation and input of programs; loading of the translator into the computer; input and running of translated programs for debugging or problem solving; preparation of assignments and transmission to the supervisor for actions; connection of the operator with the object of control; control of the course of information processing. (Author)

AD-750 652 PC$3.00/MF$0.95
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
THE FIRST IMPLEMENTATION OF THE GRAPHICAL AUTOMATIC PROGRAMMING LANGUAGE.
Technical memo.,
A. Kossiakoff, and T. P. Sleight. Jun 72, 58p Rept no. APL-TG-1183
Contract N00017-72-C-4401

Descriptors: (*Programming languages, Design), Graphics, Control sequences, Instruction manuals.
Identifiers: GAP programming language, Computer graphics, Assembly languages, Interactive computer graphics.

A process is described for automatically generating an assembly language code directly from a two-dimensional network representing the flow of data and control logic. The network used to represent the desired data processing to be programmed involves a type of graphical representation referred to as a Data Flow Circuit. A specially defined 'vocabulary' of some 50 basic Data Circuit Elements provides the building blocks for the Data Flow Circuits and the Graphical Automatic Programming (GAP) language. Each of these elements represents a set of assembly language instructions (e. g., dynamic macro statements). The automatic preparation of a computer program by this method is particularly advantageous when used with a computer-driven graphics terminal, which provides for rapid and interactive configuration of the Data Flow Circuits, on-line testing, and code generation. This new language is especially designed to produce highly efficient programs that operate in a real-time environment, where the only suitable alternative is tedious assembly language programming. It also constitutes a highly visible and unambiguous representation of information and logic flow that can be readily understood by engineers and scientists as well as computer programmers. (Author)

AD-750 660 PC$3.00/MF$0.95
Johns Hopkins Univ Silver Spring Md Applied Physics Lab

A SOLID STATE REPLACEMENT FOR SATELLITE TAPE RECORDERS.
Technical memo.,
R. F. Plachy. Jul 72, 82p Rept no. APL-TG-1194
Contract N00017-72-C-4401

Descriptors: (*Thin film storage devices, Magnetic properties), (*Data storage systems, Scientific satellites), Semiconducting films, Hall effect, Logic circuits, Epitaxial growth, Manufacturing methods.
Identifiers: Magnetic bubble domains, SAS-A satellite, Magnetic film memories, Small astronomy satellites, Permalloys.

Magnetic bubble circuits are a new type of integrated circuit employing movable magnetic domains. Because of the internal structure of magnetic bubble circuits, the most obvious applications are those involving serial data coding or storage. The report describes the operation of bubble devices and presents a detailed design of a bubble memory system for bulk data storage. This system is shown to have special application to satellite memory systems as a substitute for the present tape recorder memories. In this application the magnetic bubble memory appears to be superior to the tape recorder in power, size, and reliability. A 6 megabit bubble memory is described and a comparison made with the 6 megabit tape recorder used on the SAS-A satellite. (Author)

AD-750 665 PC$3.00/MF$0.95
Naval Research Lab Washington D C
SIGNAL PROCESSING ELEMENT FUNCTIONAL DESCRIPTION. PART 2 (PRELIMINARY). SIGNAL PROCESSING ARITHMETIC UNIT.
Interim rept.,
William R. Smith, and Harold H. Smith. Oct 72,
54p Rept no. NRL-MR-2522
See also Part 1, AD-748 996.

Descriptors: (*Digital computers, Logic circuits), Input-output devices, Data processing systems, Interfaces, Communication systems, Radar equipment, Sonar equipment.
Identifiers: *Arithmetic and logic units, Signal processing, Computer systems hardware, Microprogramming.

The NRL Signal Processing Element (SPE) is being developed to provide a high-performance signal processing facility for radar, sonar, and communication systems. It is intended to be compatible with the Navy's All Applications Digital Computer (AADC). The SPE consists of four major subsystems; a Microprogrammed Control Unit (MCU), a Buffer Store and Storage Control Unit (SPU), a Signal Processing Arithmetic Unit (SPAU), and Input/Output (I/O) units. (Author)

AD-750 670 PC$3.00/MF$0.95
Stanford Univ Calif Stanford Electronics Labs
DESIGN AND SCHEDULING OF STATICALLY CONFIGURED PIPELINES.
Technical rept.,
Leonard E. Shar. Sep 72, 184p Rept nos. SU-SEL-72-039, TR-42
Contract N00014-67-A-0112-0044

Descriptors: (*Digital computers, Design), Computer logic, Logic circuits, Data processing systems, Graphics, Mathematical logic, Matrix algebra, Permutations, Theorems, Theses, Programming (Computers), Multiple operation, Shift registers.
Identifiers: Parallel processors, Multiprogramming, Graph theory, Minicomputers.

A pipeline is considered to be a collection of segments of hardware which can operate in parallel, and each of which performs specified parts of a particular computation. If the pattern of use for these segments is fixed for each computation and identical for all computations in the pipeline, then the pipeline is said to be statically configured. Such pipelines are examined in this report. A collision is said to occur if more than one computation attempts to use a segment at the same time. A collision vector is determined for a given pipeline, and when used with a specific shift-register controller forms a collision avoidance system. Maximum throughput is achieved by using a cycle of initiations which provides the minimum average latency (i.e. time between successive initiations). (Author)

AD-750 671 PC$3.00/MF$0.95
Stanford Univ Calif Stanford Electronics Labs
ANOMALIES IN SCHEDULING UNIT: TIME TASKS.
Technical rept. no. 34,
Marc T. Kaufman. Jun 72, 28p Rept nos. SU-SEL-72-040, STAN-CS-72-310
Contract N00014-67-A-0112-0044, Grant NSF-GK-23315

Descriptors: (*Data processing systems, Multiple operation), (*Scheduling, Algorithms), Graphics, Permutations, Networks, Optimization.
Identifiers: *Multiprocessing, Graph theory, Directed graphs, Network flows, Heuristic methods.

In the paper the author examines the problem of scheduling a set of tasks on a system with a number of identical processors. Several timing anomalies are known to exist for the general case, in which the execution time can increase when inter-task constraints are removed or processors are added. It is shown that these anomalies also exist when tasks are restricted to be of equal (unit) length. Several, increasingly restrictive, heuristic scheduling algorithms are reviewed. The added processor anomaly is shown to persist through all of them, though in successively weaker form. (Author)

AD-750 672 PC$3.00/MF$0.95
Stanford Univ Calif Stanford Electronics Labs
AN ANALYSIS OF DRUM STORAGE UNITS.
Technical rept. no. 26,
Samuel H. Fuller, and Forest Baskett. Aug 72,
68p* Rept nos. SU-SEL-72-048, STAN-CS-72-317
Contracts N00014-67-A-0112-0044, AT (04-3)-515

Descriptors: (*Computer storage devices, Mathematical models), (*Data storage systems, Scheduling), Queueing theory, Algorithms, Stochastic processes.
Identifiers: Multiprogramming.

The report discusses the modeling and analysis of drum-like storage units. Two common forms of drum organizations and two common scheduling disciplines are considered: the file drum and the paging drum; first-in-first-out (FIFO) scheduling and shortest-latency-time-first (SLTF) scheduling. The modeling of the I/O requests to the drum is an important aspect of this analysis. Measurements are presented to indicate that it is realistic to model requests for records, or blocks of information to a file drum, as requests that have starting addresses uniformly distributed around the circumference of the drum and transfer times that are exponentially distributed with a mean of 1/2 to 1/3 of a drum revolution. The arrival of I/O requests is first assumed to be a Poisson process and then generalized to the case of a computer system with a finite degree of multiprogramming. (Author)

AD-750 743 PC$3.00/MF$0.95
Naval Academy Annapolis Md Div of Engineering and Weapons
GEOMETRIC CONCEPTS FOR COMPUTER GRAPHICS.
Final rept. 1 Sep 71-31 Aug 72,
J. Alan Adams. Sep 72, 236p* Rept no. EW-72-4

Descriptors: (*Programming (Computers), Graphics), Matrix algebra, Transformations (Mathematics), Vector analysis, Tensor analysis, Interpolation, Integrals, Integration, Curve fitting, Plotters.
Identifiers: *Computer graphics, Spline interpolation.

The report presents a discussion of existing techniques for representing points, lines, curves, and surfaces within a digital computer, as well as computer software procedures for manipulating and displaying computer output in graphical form. Mathematical techniques for producing axonometric and perspective views are given along with generalized techniques for rotation, translation, and scaling of geometric figures. Curve definition procedures for both explicit and parametric representation are presented for both 2-D and 3-D curves. Curve definition techniques include the use of conic sections, circular arc interpolation, cubic splines, parabolic blending, Bezier curves, and (RB sup 3) curves based upon B-splines. (Author)

AD-750 772 PC$3.00/MF$0.95
Bolt Beranek and Newman Inc Cambridge Mass
INTERFACE MESSAGE PROCESSORS FOR THE ADVANCED RESEARCH PROJECTS AGENCY (ARPA) NETWORK.
Quarterly technical rept. no. 15, 1 Jul-30 Sep 72,
Frank E. Heart. Oct 72, 20p Rept no. BBN-2468
Contract DAHC15-69-C-0179, ARPA Order-1260
See also AD-745 766.

Descriptors: (*Data processing systems, Networks), (*Digital computers, Data transmission systems), Interfaces, Remote control systems.
Identifiers: *IMP (Interface Message Processors), *Interface message processors, *Computer networks, Data processing terminals, Teleprocessing, ARPA computer network, Aloha system.

The Quarterly Technical Report, Number 15, describes the aspects of work on the ARPA computer network during the third quarter of 1972. The subjects discussed include the following: Overview; Revision of the magnetic tape option; Satellite techniques; HSMIMP program organization.

AD-750 791 PC$3.00/MF$0.95
Bell Telephone Labs Inc Whippany N J
MATHEMATICAL MODELS FOR PREDICTING PULSE CHARACTERISTICS IN DIGITAL LOGIC SYSTEMS.
Technical rept.,
J. B. Tomerdahl, A. C. Nelson, and Kay K. Mazuy. Jun 63, 26p
Contract DA-30-069-ORD-1955
Prepared in cooperation with Research Triangle Inst., Durham, N. C., Rept. no. RTI-TR-SU-17-10.

Descriptors: (*Logic circuits, Mathematical models), (*Digital computers, Reliability (Electronics)), Switching circuits, Gates (Circuits), Experimental design, Regression analysis, Curve fitting, Graphics, Analysis of variance, Pulse systems.
Identifiers: Goodness of fit tests.

The multiple use of relatively few types of basic building blocks in digital computers requires that the system designer have knowledge of the actual performance characteristics of these units in order to produce optimum designs. Worst-case analysis procedures do not yield realistic performance data. The performance prediction technique discussed in the paper is based on the development of empirical mathematical models which relate the performance variables of interest to the pertinent system parameters. Prediction equations are fitted for rise time, fall time, delay time, and storage time for a parity-check circuit. A statistical analysis of the prediction equations is made to determine the validity of the models. The goodness-of-fit of these models is presented in graphical form. A brief summary of the least squares procedure used in obtaining the coefficients of the models is given. (Author)

AD-750 897 PC$6.00/MF$0.95
International Computer Systems Inc Los Angeles Calif
PROGRAMMING FOR TRANSFERABILITY.
Final technical rept.,
Joel E. Fleiss, Guy W. Phillips, Andrew Edwards, and Larry Rieder. Sep 72, 179p* RADC-TR-72-234
Contract F30602-71-C-0311

Descriptors: (*Programming (Computers), Compatibility), Programming languages, Instruction manuals.
Identifiers: *Computer program transferability, FORTRAN, COBOL, JOVIAL programming language, Microprogramming, Assembly languages.

The document presents the results of an investigation of design and documentation techniques used in computer programming in order to develop recommendations and guidelines for easing the transfer of computer programs written for one computing environment to another. The first part of the study is concerned with a general transferability analysis and techniques to be used independent of any particular programming language. Emphasis is placed on the importance of transferability considerations during design and coding of the problem program. The second section of the study deals with higher level and assembly/macro languages. Specific suggestions for improvement of FORTRAN, JOVIAL, and COBOL program design are included. (Author)

AD-750 898 PC$3.75/MF$0.95
Planning Research Corp Mclean Va
FILE ORGANIZATION MODELING SYSTEM (FORMS), VOLUME I.
Final rept. Dec 70-Dec 71,
Robert C. Mullins. Sep 72, 41p* Rept no. PRC-R-1589 RADC-TR-72-236-Vol-I
Contract F30602-71-C-0130
See also AD-750 899.

Descriptors: (*Data processing systems, Design), (*Data storage systems, Information retrieval), Syntax, Programming languages.
Identifiers: FORMS (File ORganization Modeling System), File organization modeling system, File structures, PL/1 programming language, Computerized simulation.

The document reports the technical efforts and achievements in the File Organization and Modeling System (FORMS) Continuation project. The report presents a chronology of the developments culminated by an evaluation of the finished modeling system. The evaluation phase is described as are the products delivered. (Author)

AD-750 899 PC$4.50/MF$0.95
Planning Research Corp Mclean Va
FILE ORGANIZATION MODELING SYSTEM (FORMS). VOLUME II. USER'S MANUAL.
Final rept. Dec 70-Dec 71,
Robert C. Mullins.. Sep 72, 60p Rept no. PRC-R-1589 RADC-TR-72-236-Vol-2
Contract F30602-71-C-0130
See also AD-750 898.

Descriptors: (*Data processing systems, Design), (*Data storage systems, Information retrieval), (*Programming (Computers), Instruction manuals), Programming languages, Operation.
Identifiers: FORMS (File Organization Modeling System), File organization modeling system, File structures, PL/1 programming language, IBM system /360 operating systems, Computerized simulation.

The report is a User's Manual for the FORMS System. It contains a complete description of the user's interface, the specific model implementation and examples of FORMS runs. (Author)

AD-750 963 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
ONE-LEVEL STORAGE SYSTEM,
Kh. F. Kuleev, M. B. Nemirovskii, and F. Z. Rokhlin. 20 Jul 72, 8p Rept no. FTD-HC-23-0860-72
Unedited rough draft trans. of Aviatsionnyi Institut, Kazan. Trudy (USSR) n104 p64-67 1970.

Descriptors: (*Data storage systems, Design), Programming (Computers), Algorithms, USSR.
Identifiers: Translations.

The most common methods of constructing a single level memory are described. A procedure is proposed for organizing a single level memory using an adaptive priority system requiring minimum equipment expenditures.

AD-750 968 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE STRUCTURE OF COMPUTER SYSTEMS WHICH ARE STABLE WITH CHANGING NUMBERS OF COMPUTERS,
Yu. G. Kosarev. 14 Aug 72, 17p Rept no. FTD-HC-23-0856-72
Unedited rough draft trans. of Vychislitelnye Sistemy (USSR) n42 p59-73 1970.

Descriptors: (*Digital computers, Reliability (Electronics)), (*Logic circuits, Reliability (Electronics)), Switching circuits, Computer logic, USSR.
Identifiers: Translations, Switching theory.

When developing multicomputer computer systems (CS), the possibility must be considered that the computer elements and other CS elements will fail due to both their insufficient reliability, and unfavorable external effects (overheatings, radiation, mechanical damages, and so on). It is desirable that the CS not only maintain their working order under these conditions, but that they should continue a problem solving process interrupted by a failure; and, moreover, that the working order restoration time should be sufficiently small. Two methods which mutually complement one another are examined in order to facilitate the given problem's solution.

AD-750 982 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE USE OF A SYSTEM OF GEOMETRIC CODES IN PERMANENT MEMORY UNITS (P-ZU),
V. B. Smolov, Yu. D. Chekmarev, and Yu. F. Mukhopad. 22 Sep 72, 16p Rept no. FTD-HT-23-1356-72
Edited trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Priborostroenie (USSR) n6 p73-79 1971, by Charles T. Ostertag, Jr.

Descriptors: (*Data storage systems, Design), (*Coding, Programming (Computers)), Mathematical logic, Binary arithmetic, USSR.
Identifiers: Translations, Geometry codes, Signal processing.

The structures of parallel memory units with random access and matrix number-unit are studied. Effectiveness is increased using a special geometric coding method of representation of numbers intended for storage. The geometric code of the number means a code produced by conversion of a number represented in binary positional codes of length N with M decoders. Hardware requirements for storage of numbers in geometric codes are calculated. The method suggested is quite flexible and allows the hardware requirements to be minimized in each case by minimizing the address portion, number unit and by using the properties of the number file to be stored. The author's claim that the use of the geometric coding method triples the effectiveness of long term memory units. (Author)

AD-891 062 PC$4.25/MF$0.95
Braddock, Dunn, and McDonald, Inc., El Paso, Tex.
NETSIM SIMULATION PROGRAM USER'S MANUAL,
Allan F. Malmberg. Jun 71, 44p BDM-26-71-T-0050
Distribution Limitation now Removed.

Descriptors: (*Programming (Computers), Instruction manuals), (*Logic circuits, Design), (*Switching circuits, Mathematical models), Digital computers, Electrical networks, Analog systems, Interfaces.
Identifiers: Computerized simulation, NETSIM computer program, DISIM computer program, NET-2 computer program, Network synthesis, FORTRAN extended programming language, CDC 6000 series computers, FORTRAN.

Several large programs have been written to accomplish the simulation of various kinds of systems. Two important areas of simulation which have received attention are (1) the simulation of systems composed exclusively of digital switching elements, and (2) the simulation of analog electronic circuitry. The NETSIM program consists of the interfacing of two programs, DISIM and NET-2, which handle these two areas of simulation. By combining the programs into one package the user has available to him a powerful tool for the simulation of mixed digital-analog systems. The report covers only aspects related to the interfacing of DISIM and NET-2. It is assumed the user is familiar with the network description details for both DISIM and NET-2 which are covered in manuals for each program.

JPRS-57251 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
SPECIAL CONSIDERATIONS IN THE USE OF GEOMETRIC CODING IN TRANSFORMER STORAGE DEVICES,
B. B. Smolov, and Yu. D. Chekmarev. 13 Oct 72, 8p
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Priborostroenie (USSR) n7 p73-77 1972.

Descriptors: (*Computer storage devices, *Coding theory), Binary digits, Statistical analysis, Translations, USSR.
Identifiers: Geometry codes.

The report contains a study of the conditions and methods of employing the advantages of the number block structure. The information capacity of a geometric code number line is defined. An evaluation of expenditures on the number of cores used and the number of connecting elements is made. (Author)

N72-28196 PC$6.75/MF$0.95
Information Research Associates, Inc., San Antonio, Tex.
RELIABILITY TECHNIQUES FOR COMPUTER EXECUTIVE PROGRAMS.
17 May 72, 91p NASA-CR-123736
Contract NAS8-2666-9

Descriptors: *Computer programs, *Computer techniques, *Management systems, *Reliability analysis, Algorithms, Coding, Proving, Redundancy.

For abstract, see STAR 10 19.

N72-28200 PC$8.75/MF$0.95
Teledyne Brown Engineering, Huntsville, Ala. Systems Design and Simulation Branch.
SHUTTLE OPERATIONS SIMULATION MODEL PROGRAMMERS/USERS MANUAL.
Summary Report
D. G. Porter. Jun 72, 132p NASA-CR-123735, ASD-ASTN-1533
Contract NAS8-21804

Descriptors: *Computerized simulation, *Operations research, *Space shuttles, *Spacecraft performance, Dynamic models, Flight characteristics, Launch windows, Performance prediction.

For abstract, see STAR 10 19.

N72-28458 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
FEASIBILITY STUDY REPLACEMENT OF THE INOPERATIVE DECOMMUTATING BUFFER SUBSYSTEM FOR THE INSTRUMENTATION CHECKOUT COMPLEX IN THE QUALITY AND RELIABILITY ASSURANCE LABORATORY.
J. W. Hilliard. 26 May 72, 27p NASA-TM-X-64676

Descriptors: *Data processing equipment, *Decommutators, *Maintenance, *Test equipment, Real time operation, Signal processing, Telemetry.

For abstract, see STAR 10 19.

N72-29159 PC$6.25/MF$0.95
Advanced Technology Labs., Inc., Jericho, N.Y.
INSTRUCTIONS FOR THE USE OF THE FORTRAN 4 PROGRAM COMPT.
E. Alzner. Dec 71, 81p NASA-CR-127766, ATL-TM-162

Descriptors: *Blades, *Computer programming, *Computer programs, *Flow distribution, Fortran, Manuals, Two dimensional flow.

For abstract, see STAR 10 20.

N72-29160 PC$7.75/MF$0.95
Mississippi State Univ., State College.
AN INNOVATIVE APPROACH TO COMPENSATOR DESIGN.
Interim Report, 1 Jan. - 30 Apr. 1972
J. R. Mitchell. 30 Apr 72, 115p NASA-CR-123747
Contract NAS8-21377

Descriptors: *Compensators, *Computerized design, *Control equipment, *Frequency response, Algorithms, Computer programming, Digital computers, Mathematical models.

For abstract, see STAR 10 20.

N72-29161 PC$3.75/MF$0.95
Harvard Univ., Cambridge, Mass.
ARBITRARY GRAMMARS GENERATING CONTEXT-FREE LANGUAGES.
B. S. Baker. 14 Jun 72, 31p NASA-CR-127764, REPT-11-72
Contract NGR-22-007-176

Descriptors: *Context free languages, *Grammars, Programming languages, Set theory, Symbolic programming.

For abstract, see STAR 10 20.

N72-29164 PC$4.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
EXTENDED PRECISION SOFTWARE PACKAGES.
E. J. Phillips. Feb 72, 36p NASA-TM-X-65968, X-552-72-119

Descriptors: *Decimals, *Floating point arithmetic, *Fortran, *Programming languages, Computer programs, Ibm 360 computer, Subroutines.

For abstract, see STAR 10 20.

N72-29166 PC$4.50/MF$0.95
National Physical Lab., Teddington (England). Div. of Numerical Analysis and Computing.
BASIC STATEMENT TIMES FOR ALGOL 60.
B. A. Wichmann. May 72, 47p NPL-NAC-15

Descriptors: *Algol, *Machine oriented languages, *Time measurement, Compilers, Computer programs, Computerized simulation, Programming languages, Statistical analysis, Symbols.

For abstract, see STAR 10 20.

N72-30189 PC$3.75/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
APPLICATIONS OF SYMBOLIC COMPUTING METHODS TO THE DYNAMIC ANALYSIS OF LARGE SYSTEMS.
C. F. Lorenzo, and J. P. Riehl. 1971, 34p
NASA-TM-X-67908, E-6519
Conf- Presented At 5th Congr. of the Intern. Federation of Autom. Control, Paris, 12-17 Jun. 1972

Descriptors: *Programming languages, *Symbols, Computer programs, Dynamic characteristics, Transfer functions.

For abstract, see STAR 10 21.

N72-30190 PC$4.25/MF$0.95
Teledyne Brown Engineering, Huntsville, Ala.
DEVELOPMENT OF AMTRAN ON THE DATACRAFT DC6024.
Interim Report
May 72, 44p NASA-CR-123796, MSFC-SE-1528
Contract NAS8-26756

Descriptors: *Computer systems programs, *Multiple output programs, *Real time operation, *Time sharing, Flow charts, Remote consoles, Subroutines.

For abstract, see STAR 10 21.

PB-212 476 PC$3.00/MF$0.95
Texas Univ., Austin. Dept. of Computer Sciences.
A PROCESS-ORIENTED MODEL OF RESOURCE DEMANDS IN LARGE, MULTIPROCESSING COMPUTER UTILITIES.
Final rept.,
Douglas Stoddard Johnson. Aug 72, 148p TSN-29
Grant NSF-GJ-1084

Descriptors: (*Multiprocessing, Performance evaluation), Digital computers, Computer systems programs, Theses.
Identifiers: CDC 6600 computers.

The study defines through analysis of the output of an event-driven software monitor, a hierarchical model of a complete computer system and specifies resources available to the processes at each level of the hierarchy. The lowest level of this structure consists entirely of elements of the operating system. The results obtained demonstrate that the components of the system library dominate the operation of the system during prime shift operations. The elements of the system library are characterized in terms of their resource comsumption. (Author)

PB-212 477 PC$3.00/MF$0.95
Texas Univ., Austin. Dept. of Computer Sciences.
TRACE-DRIVEN MODELING STUDIES OF THE PERFORMANCE OF COMPUTER SYSTEMS.
Final rept.,
Stephen Warner Sherman. Aug 72, 193p* TSN-30
Grant NSF-GJ-1084

Descriptors: (*Computers, Performance evaluation), Computerized simulation, Mathematical models, Operating systems (Computers), Systems engineering, Scheduling, Algorithms, Multiprogramming, feasibility, Theses.
Identifiers: CDC 6600 computers.

The technique of trace-driven modeling is applied to large-scale computer systems (the Control Data Corporation's 6600 computer and the UT-1 and UT-2 operating systems in use at the University of Texas Computation Center) to illustrate the feasibility of implementation of the technique as well as the range of system modifications that trace-driven modeling is capable of studying. Studies of system modifications illustrate the advantages and problems associated with trace-driven models and the results of these studies are used to resolve some of the relationships between the components of complex computer systems. It is felt that trace-driven modeling represents one of the first steps toward the development of semi-empirical study of computer science. (Author)

PB-212 569 PC$3.00/MF$0.95
Colorado State Univ., Fort Collins. Dept. of Civil Engineering.
COMPUTER AND CONTROL EQUIPMENT.
Technical memo.
Dec 71, 46p* TR-2 W73-00146, OWRR-C-2207 (2)
Contracts DI-14-31-0001-3410, OWRR-C-2207 (2)
Report on Metropolitan Water Intelligence Systems. Prepared in cooperation with Medearis (Kenneth) and Associates, Fort Collins, Colo.

Descriptors: (*Digital computers, Performance evaluation), (*Combined sewers, Automatic control), (*Sewers, Automatic control), (*Urban planning, Combined sewers), Urban areas, Public utilities, Management planning, Control equipment, Computer systems hardware, Water pollution.
Identifiers: *Minicomputers, Water pollution control.

The use of digital computers for the centralized monitoring and control of various operations is gaining acceptance in a number of fields. Under such a centralized supervisory system, all important performance variables are transmitted, or telemetered, to a central location where they are logged, displayed, and manipulated as may be required to achieve the desired operations. The initial automation effort is usually substantial, being somewhat dependent on the project scope. The selection of computer and associated peripheral equipment for such an effort is of significant importance. Basic information concerning computers and associated peripheral equipment that should be of use to management level personnel is presented. A concise glossary of commonly encountered computer terms, and the characteristics of a number of commonly used mini-computers is also included. (Author)

PB-212 621 PC$3.00/MF$0.95
Research Inst. of National Defence, Stockholm (Sweden).
FROM PARSING TREE TO PREDICATE CALCULUS. A PRELIMINARY SURVEY.
Jacob Palme. Feb 72, 100p FOA-P-C8313-M3 (E5)

Descriptors: (*Artificial intelligence, *Information retrieval), Computer programming, Semantics, Mathematical logic, Trees (Mathematics), Graph theory, Algorithms, English language, Sweden, Syntax.
Identifiers: Parsing, Predicate calculus, Parsing trees, *Question answering systems, Swedish question answering project.

In a natural language question answering system, the input sentences are first parsed producing a parsing tree. This parsing tree is then translated into a predicate calculus relational network representation. The report describes the latter step. The programming methodology and program structure is described for the simplified English version of the SQAP (Swedish Question Answering Project) system. (Author)

PB-212 630 PC$3.00/MF$0.95
Illinois Univ., Urbana. Dept. of Computer Science.
ETS (EDUCATIONAL TIMESHARING SYSTEM) STUDENT'S GUIDE.
Research rept.,
Al Davis, Jim Hart, Don Oxley, and Keith Phillips.
Jul 72, 42p UIUCDCS-R-72-547
Grant NSF-GJ-812

Descriptors: (*Programming manuals, Computer programming), Training devices, Monitor routines, Editing routines, Interpreter routines, Assembler routines, Time sharing.
Identifiers: PDP-11 computers, ETS (Educational Timesharing System), Educational timesharing system, Computer aided instruction.

The manual is intended to serve as a reference to persons who wish to use any of the systems programs in the permanent library of the Educational Timesharing System - ETS. It discusses the basic commands used to communicate with the monitor, the editor (EDETS), the interpreter (DEBETS), the assembler (ASSETS), and the CAI system (GIZMO). (Author)

PB-212 722 PC$3.00/MF$0.95
California Univ., Santa Cruz. Computer Center.
THE POLISH ASSEMBLER.
Topical rept.,
Harry D. Huskey. Jul 72, 34p UCSC-ICS-72-1
Grant NSF-GJ-30436X

Descriptors: (*Assembler routines, Design), Assembly languages, Syntax, Semantics, Flow charts, Error detection codes.
Identifiers: PASS programming language, Varian 620i computers.

The assembler program described herein was designed specifically with the limitations of minicomputers in mind. It employs a very concise input language to minimize input and output time when the only available I/O device is a slow teletypewriter. The assembler program is small enough to allow assemble-and-go operation in many cases. The particular implementation described here runs on a Varian 620i computer. The report includes a complete listing of the assembler in its own language. (Author)

9C. Electrical and Electronic Engineering

AD-750 981 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
BUDAPEST: EASTERN WINDOW FOR THE WEST NOTABLE 'ELECTRONIC PARTICIPATION' DURING THE INTERNATIONAL FAIR IN BUDAPEST.
6 Oct 72, 11p Rept no. FTD-HC-23-333-72
Edited trans. of mono. Flexwe and Flexwe fuer Nauch, Budapest, 1971 p1-3.

Descriptors: (*Electronic equipment, Commerce), Hungary.
Identifiers: Translations.

The article describes wares displayed at the Budapest International Fair. The focus of the fair was mostly on electronics. Many countries participated such as Poland, Czechoslavakia, Germany, Russia, Great Britain, Bulgaria and U.S.A. (Author)

AD-844 560 PC$9.00/MF$0.95
Hughes Aircraft Co., Fullerton, Calif. Environmental Engineering Dept.
SHOCK AND VIBRATION TECHNICAL DESIGN GUIDE. VOLUME III. RELATED TECHNOLOGIES, BOOK 2 OF 2.
Rept. for Oct 66-Jul 68,
T. Bruce Henderson. 1968, 626p FR68-10-671-Bk-2
Contract DAAB07-67-C-0111

See also Book 1, AD-844 559. Distribution Limitation now Removed.

Descriptors: (*Army equipment, *Electronic equipment), (*Packaging, Design), Mechanical engineering, Fatigue (Mechanics), Mechanical impedance, Stresses, Buckling (Mechanics), Shear stresses, Loading (Mechanics), Damping, Elasticity, Failure (Mechanics), Bending, Beams (Structural), Structural properties, Bibliographies, Design criteria.
Identifiers: *Management information systems.

The objective of this volume is to present a compilation of the various mechanical engineering disciplines that make up the experience of the structural engineer. This compendium relates these diverse areas of technical knowledge to the general problem of dynamic integrity in the equipment system. For convenience, the eleven chapters of volume 3 are organized into three categories; those subjects dealing with the analytical aspect of structural dynamics; those subjects concerned with the validation of the equipment system and the accumulation of dynamic data; and those subjects dealing with the execution of the equipment package. (Author)

N72-28243 PC$3.00/MF$0.95
Connecticut Univ., Storrs. Dept. of Electrical Engineering.
POLE PLACEMENT WITH CONSTANT GAIN OUTPUT FEEDBACK.
B. Sridhar, and D. P. Lindorff. May 72, 17p
NASA-CR-127446, TR-72-3
Contract NGL-07-002-002

Descriptors: *Amplification, *Feedback control, *Linear systems, *Systems engineering, Control theory, Least squares method, Output.

For abstract, see STAR 10 19.

N72-28247 PC$8.50/MF$0.95
Technische Hochschule Hannover (West Germany). Fakultaet Fuer Maschinenwesen.
A CONTRIBUTION TO THE OPTIMUM DESIGN OF ELECTRICAL MACHINES WITH NONLINEAR COMPUTER PROGRAMMING . EIN BEITRAG ZUR ENTWURFSOPTIMIERUNG ELEKTRISCHER MASCHINEN MIT DER NICHTLINEAREN PROGRAMMIERUNG.
Ph.D. Thesis
K. Heuck. 1971, 127p

Descriptors: *Computerized design, *Electromechanical devices, *Nonlinear programming, Machinery, Mathematical models, Optimization.

For abstract, see STAR 10 19.

N72-30200 PC-GPO/MF$0.95-NTIS
National Aeronautics and Space Administration, Washington, D.C.
SHOCK AND VIBRATION TECHNOLOGY WITH APPLICATIONS TO ELECTRICAL SYSTEMS.
Technology Utilization
R. L. Eshleman. 1972, 170p NASA-SP-5100, LC-70-174580
Paper copy available from GPO $1.00

Descriptors: *Electric equipment, *Shock wave attenuation, *Technology transfer, *Vibration damping, Computerized simulation, Mechanical shock, Technology utilization.

For abstract, see STAR 10 21.

9D. Information Theory

AD-750 320 PC$3.00/MF$0.95
White Sands Missile Range N Mex
FILTERING OF TIME CORRELATED DATA,
Richard H. Duncan. 1972, 13p

Descriptors: (*Information theory, Statistical analysis), Time series analysis, Correlation techniques, Errors, Matrix algebra, Least squares method.
Identifiers: Filtering theory, Recursive filters, Ergodic processes, Signal processing, Data reduction.

Convential filter theory neglects autocorrelation of errors in input data. The assumption that this can be done lead to erroneous asymptotic behavior of filter smoothing factors at high data rates. This has been demonstrated by introducing a more realistic correlation model into the theories of the moving arc least squares filter and a simple recursive filter. The smoothing factor of the former in the revised theory is asymptotically independent of rate, whereas the conventional theory predicts 1/ (square root of r) behavior. The theory of recursive filter exhibits a finite optimum rate. The optimum rate is infinite if correlation of input data errors is neglected.

AD-750 335 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
A NEW APPROACH TO DIGITAL SIGNAL DETECTION,
William A. Huber. 1972, 15p

Descriptors: (*Information theory, Data transmission systems), Digital systems, White Noise, Coding, Networks, Decision theory.
Identifiers: *Data transmission, Signal processing.

The paper discusses the design and operation of a new digital signal detector that is characterized by the following operational features: (1) has low sensitivity to signal amplitude variations; (2) uses multiple signal bit measurements; (3) correlates these measurements in a network weighted to match operational conditions; and (4) determines the status of the detected signals by statistical methods. The new digital detector functions as a wave-form classifier; i.e., it samples sequential segments of the received signal waveform and encodes these data into binary digital words. These word groups are then applied to weighted networks that function as classifiers placing the sampled data into either the 'plus one' or 'minus one' categories. A detailed description of each of these functions is presented. (Author)

AD-750 421 Reprint
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
DISCRETE REPRESENTATION OF SIGNALS,
Alan V. Oppenheim, and Donald H. Johnson. 13 Mar 72, 12p
Contract DAAB07-71-C-0300, Grant NSF-GK-31353
Errata sheet inserted. Revision of report dated 12 Nov 71. Sponsored in part by Advanced Research Projects Agency, Arlington, Va.
Availability: Pub. in Proceedings of the IEEE, v60 n6 p681-691 Jun 72.

Descriptors: (*Information theory, Spectrum analyzers), Integral transforms, Speech recognition, Sampling.
Identifiers: Signal processing, Digital simulation, Time invariant systems, Laplace transformation, Spectrum analysis.

In processing continuous-time signals by digital means, it is necessary to represent the signal by a digital sequence. There are many ways other than periodic sampling for obtaining such a sequence. The requirements for such representations and some examples are discussed within the framework of simulating linear time-invariant systems. The representation of digital sequences by other digital sequences is also discussed, with particular emphasis on the use of such representations to implement a nonlinear warping of the digital frequency axis. Some applications and hardware implementation of this digital-frequency warping are described. (Author)

AD-750 537 PC$3.00/MF$0.95
North Carolina State Univ Raleigh Dept of Electrical Engineering
APPLICATION OF SHANNON'S RATE DISTORTION THEORY TO SPEECH ENCODING,
Huseyin Abut. 15 Sep 72, 89p AFOSR-TR-72-1974
Contract F44620-69-C-0033
Report on Project THEMIS.

Descriptors: (*Information theory, *Speech recognition), (*Coding, Speech), Distortion, Analysis of variance, Regression analysis, White noise, Power spectra, Probability density functions, Digital-to-analog converters, Entropy, Sampling, Low-pass filters, Theses.
Identifiers: Themis project, Data compression, Signal processing, Shannon functions, Data transmission.

The digital encoding of speech is considered from the point of view of Shannon's rate distortion theory. First, a non-adaptive predictor-subtractor operating at intervals less than the pitch period is used to whiten the speech signal. This makes possible the derivation of upper and lower bounds on Shannon's rate distortion function which gives the minimum rate necessary to achieve a specified mean square error. Finally, a subjective test was performed to determine the relationship between speech quality and the value of the rate distortion function. (Author)

AD-750 785 PC$3.00/MF$0.95
University of Southern California Los Angeles Dept of Electrical Engineering
SEMIANNUAL TECHNICAL REPORT 1 MARCH 1972 THROUGH 31 AUGUST 1972,
William K. Pratt. 31 Aug 72, 144p Rept no. USCEE-425
Contract F08606-72-C-0008, ARPA Order-1706
See also report dated 29 Feb 72, AD-740 185.

Descriptors: (*Coding, Images), (*Data processing systems, Pattern recognition), Pulse code modulation, Color television, Digital computers, White Noise, Integral transforms, Entropy, Probability density functions, Statistical analysis, Errors.
Identifiers: *Image processing, Wiener filters, Quantization, Signal processing, Fourier transformation, Histograms.

The report summarizes the image processing research activities performed by the University of Southern California under contract no. Office. The research program, entitled, Image Processing Research, has as its primary purpose the analysis and development of techniques and systems for efficiently generating, processing, transmitting, and displaying visual images and two dimensional data arrays. Research is oriented toward digital processing and transmission systems. Four task areas are reported on: (1) Image Coding Projects, the investigation of digital bandwidth reduction coding methods; (2) Image Enhancement and Restoration Projects, the improvement of image fidelity and presentation format; (3) Image Detection and Measurement Projects, the recognition of objects within pictures and quantitative measurement of image features; (4) Image Processing Support Projects, a description of the USC image processing facilities accessible over the ARPANET. (Author)

AD-750 994 Reprint
IBM Watson Research Center Yorktown Heights N Y
ON THE ANALYSIS AND MODELING OF A CLASS OF COMPUTER COMMUNICATION SYSTEMS,
Wesley W. Chu, and Alan G. Konheim. 28 Feb 72, 17p
Contracts F44620-70-C-0063, N00014-69-A-0200-4027
Availability: Pub. in IEEE Transactions on Communications, vCOM-20 n3 p645-660 Jun 72. Available in microfiche only.

Descriptors: (*Information theory, Data transmission systems), (*Data transmission systems, Computers), Multiplex, Mathematical models, Scheduling, Statistical analysis, Time sharing, Errors, Queueing theory.

Recent advances in computer communications are discussed including computer-traffic and channel error characteristics, optimal fixed message block size, statistical multiplexing, and loop systems. A unified model is developed and then used to analyze the queueing behavior of the star and loop systems. Numerical results for selected traffic intensities and message lengths, given in graphical form, provide insight into the performance of these systems. (Author)

N72-28198 PC$14.25/MF$0.95
Cornell Univ., Ithaca, N.Y. School of Electrical Engineering.
STUDY OF SEQUENTIAL DECODING.
Final Report
F. Jelinek. Feb 72, 241p NASA-CR-114450
Contract NAS2-5643

Descriptors: *Coding, *Data processing, *Noise reduction, *Sequential control, *Space communication, Algorithms, Data reduction, Decoding, Information, Information theory.

For abstract, see STAR 10 19.

N72-28202 PC$3.00/MF$0.95
Brown Univ., Providence, R.I. Center for Computer and Information Sciences.
THE COMPLEXITY OF DETERMINISTIC SOURCE ENCODING WITH A FIDELITY CRITERION.
J. E. Savage. May 71, 17p NASA-CR-127705
Contracts NGR-40-002-082, NGR-40-002-090

Descriptors: *Accuracy, *Coding, *Computer programming, Codes, Decoding, Distortion, Error correcting devices.

For abstract, see STAR 10 19.

N72-29115 PC$8.75/MF$0.95
Martin Marietta Corp., Denver, Colo.
PROTOTYPE DATA TERMINAL-MULTIPLEXER/DEMULTIPLEXER.
Final Report
D. E. Leck, and J. E. Goodwin. May 72, 131p
NASA-CR-123746, MCR-72-123
Contract NAS8-27538

Descriptors: *Data processing terminals, *Multiplexing, *Redundancy, Channels (data transmission), Data transmission, Signal detection, Waveforms.

For abstract, see STAR 10 20.

N72-30191 PC$5.50/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
QUANTIZATION NOISE IN DIGITAL SPEECH.
M.S. Thesis- Houston Univ.
O. L. Schmidt. Aug 72, 67p NASA-TM-X-58097, MSC-07225

Descriptors: *Digital to analog converters, *Electromagnetic noise, Consonants (speech), Intelligibility, Speech.

For abstract, see STAR 10 21.

9E. Subsystems

AD-750 430 Reprint
Northwestern Univ Evanston Ill Dept of Electrical Engineering
A SCATTERING MATRIX SYNTHESIS TECHNIQUE FOR TRANSFORMERS, CIRCULATORS, AND GYRATORS,
H. E. Mussman, and S. L. Hakimi. 31 Jan 72, 4p
AFOSR-TR-72-1981
Grant AF-AFOSR-2103-71
Prepared in cooperation with Bell Telephone Labs., Naperville, Ill. Revision of report dated 21 Oct 71.
Availability: Pub. in IEEE Transactions on Circuit Theory, vCT-19 n4 p382-383 Jul 72.

Descriptors: (*Electrical networks, Synthesis), S-matrix, Transformers, Gyroscopes, Waveguide circulators.
Identifiers: *Network analysis theory, Network synthesis, Gyrators.

An active scattering matrix synthesis technique is presented. This technique leads to a unified design procedure for ideal transformers, circulators, and gyrators. (Author)

AD-750 737 PC$3.00/MF$0.95
Illinois Univ Urbana Dept of Electrical Engineering
ANALYSIS OF DISCONTINUITIES AND COUPLING PHENONENA IN MICROSTRIP LINES.
Scientific rept.,
Yahya Rahmat-Samii, and Tatsuo Itah. Sep 72, 92p Rept no. UILU-ENG-72-2549 AROD-5405:33-E
Grants DA-ARO-D-31-124-71-G77, NSF-GK-25074
Also available as Rept. no. UIAL-72-10.

Descriptors: (*Integrated circuits, Microwave frequency), (*Strip transmission lines, Integrated circuits), Fourier analysis, Integral transforms, Partial differential equations, Green's function, Mathematical models, Substrates, Numerical analysis.
Identifiers: Galerkin method, Microstrip circuits, Fourier transformation.

An attempt is made to develop an analytical method for investigating the discontinuities and coupling phenomena in microstrip lines under the quasi-TEM approximation. Fourier domain analysis along with Galerkin's method are employed for formulating the problem. Lumped circuit representation is used to show the effect of discontinuity in the microstrip structure. The degree of success that has been achieved in this investigation has been tested by applying the present method to several representative problems, e.g., coupled pairs of microstrip transmission lines, abruptly ended microstrip line, gap in microstrip lines etc. The result obtained by the use of Fourier and Galerkin techniques have been found quite encouraging. (Author)

AD-750 739 PC$3.00/MF$0.95
Navy Underwater Sound Lab New London Conn
TEST PROCEDURES TO DETERMINE PHASE RELATIONSHIP OF LOOP ANTENNA AT-317/BRR USING TEST SET AN/BRM-1.
1 Nov 69, 12p Rept no. NUSL-Pub-1074

Descriptors: (*Loop antennas, *Loran equipment), Phase measurement, Test methods, Test sets.
Identifiers: AN/BRM-1, AN/WPN-3.

Specific phase relationships are required between the loop antenna AT-317/BRR foreaft (F/A) and athwart (ATH) loop outputs for a given LORAN C transmitting station bearing. This test procedure was primarily developed to identify these phase relationships at the antenna input to the AN/WPN-3 navigation equipment. Additional tests have been included in these test procedures to supplement antenna system maintenance techniques. (Author)

AD-750 767 PC$3.00/MF$0.95
Rhode Island Univ Kingston Dept of Electrical Engineering
INTERACTIVE MINIMAX DESIGN OF NONRECURSIVE DIGITAL FILTERS.
Final technical rept.,
Donald W. Tufts, James T. Lewis, and Harlan S. Hersey. 16 Oct 72, 48p Rept no. URI-EE-4044/1
Contract N00014-68-A-0215-0006

Descriptors: (*Electric filters, Design), (*Linear programming, Approximation (Mathematics)), Minimax technique, Low-pass filters, High-pass filters, Band-pass filters, Graphics, Theorems.
Identifiers: *Digital filters, *Nonrecursive filters, Computer graphics, Approximation theory, Frequency response.

The problem of finding a mimimax approximation to an ideal frequency response of a nonrecursive digital filter is studied. The general Remes exchange algorithm for computing the approximation has been implemented using a computer graphics display. Dependence of sidelobe level on the transition band width is considered. In order to obtain a tighter fit in certain regions the techniques of approximation with restricted range are used to compute an approximation which is constrained to lie between two restraining curves. Error trade-off between unconstrained and constrained approximations is considered. A careful mathematical study of discretization error is made. A comparison is made between the authors' approach using restraining curves and the approaches of other investigators in this area. (Author)

AD-750 918 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
MULTILAYERED PRINTED-CIRCUIT ASSEMBLY,
N. N. Ushakov. 9 Aug 72, 16p Rept no. FTD-HT-23-250-72
Edited trans. of Entsiklopediya Izmerenii, Kontrolya i Avtomatizatsii (USSR) n14 p11-14 1970, by Henry Peck.

Descriptors: (*Printed circuits, Microminiaturization (Electronics)), Reliability (Electronics), Manufacturing methods, USSR.
Identifiers: Translations.

Microminiaturization cuts cost, size, and weight in electronic equipment, but all types of microminiaturization have their individual difficulties. This augments to the point where the volume of conductors to be connected almost becomes as large as the equipment. This resulted in the use of p-c boards, which can be made in many ways, a few of which are described in the report. (Author)

AD-750 947 PC$3.25/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
COMBINED OPTIMIZATION OF THE ELECTRICAL AND STRUCTURAL PARAMETERS OF AN INTEGRATED CIRCUIT,
E. I. Belyaev. 7 Aug 72, 21p Rept no. FTD-HT-23-261-72
Edited trans. from Mikroelektronika (USSR) n3 p267-281 1969, by Henry Peck.

Descriptors: (*Integrated circuits, Design), Optimization, Reliability (Electronics), USSR.
Identifiers: Translations.

Integrated circuits can be optimized by the conditional extremum method, because the electrical parameters and permissible modes of the components are continuous functions of the parameters of the technological process. It is advisable to use the parameters of the technological process as input (primary) parameters. The boundary of the region of valid integrated circuits is calculated in their space (further serving as the condition of optimization) and it is assigned in the form of the function of the criterion of optimization (productivity, cost, dimensions).

AD-750 992 Reprint
Southern Methodist Univ Dallas Tex Information and Control Sciences Center
AN ITERATIVE METHOD OF SYNTHESIZING NONLINEAR NETWORKS WITH A PRESCRIBED SMALL-SIGNAL BEHAVIOR.
Behrouz Peikari. 1971, 3p AFOSR-TR-72-2045
Contract F44620-68-C-0023, Grant NGL-44-007-006
Availability: Pub. in Proceedings of the International Symposium on Circuit Theory, London, England, Sep 71 p18-19 1971.

Descriptors: (*Electrical networks, Synthesis), Mathematical models, Iterative methods, Nonlinear systems.
Identifiers: Network analysis theory, *Network synthesis, Time invariant systems.

The paper presents an iterative method of synthesizing first order nonlinear time-invariant networks whose small signal behavior approximates a prescribed linear time-varying network. The iterative method employed makes use of a generalized steepest descent criterion to determine the characteristics of the nonlinear network in an optimal fashion. The advantage of this method over existing analytical techniques is that in this method the slowly-varying restriction on the prescribed linear network is removed. (Author)

N72-28157 PC$4.00/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Oberpfaffenhofen (West Germany). Inst. Fuer Flugfunk Und Mikrowellen.
REVIEW OF CASSEGRAIN ANTENNAS BASED ON LITERATURE STUDIES.
P. Sliwinski. 1972, 40p DLR-MITT-72-11
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Antenna radiation patterns, *Cassegrain antennas, *Geometry, Antenna feeds, Excitation, Literature.

For abstract, see STAR 10 19.

N72-28172 PC$4.75/MF$0.95
Geotronics, Inc., Falls Church, Va.
MATCHED PAIR CONICAL SPIRAL ANTENNAS.
Final Report
R. E. Metzler. Apr 72, 54p NASA-CR-122511
Contract NAS5-23053

Descriptors: *Interferometers, *Spiral antennas, Bandwidth, Pattern recognition, Very high frequencies.

For abstract, see STAR 10 19.

N72-28245 PC$14.50/MF$0.95
Toulouse Univ. (France).
STUDY OF GENERATORS USING A POLYPHASE RECTIFIER AND DYNAMIC FILTER FOR COMMAND SYSTEMS . ETUDE DES GENERATEURS UTILISANT UN REDRESSEUR POLYPHASE ET UN FILTRE DYNAMIQUE EN TANT QUE SYSTEMES DE COMMANDE.
Ph.D. Thesis
R. Prajoux. 14 Dec 71, 247p

Descriptors: *Electronic filters, *Rectifiers, *Signal generators, Command and control.

For abstract, see STAR 10 19.

N72-28246 PC$5.25/MF$0.95
Texas Instruments, Inc., Dallas.
DEVELOPMENT OF BEAM LEADED LOW POWER LOGIC CIRCUITS.
Final Report
B. W. Smith, and F. Malone. Mar 72, 63p
NASA-CR-112099, REPT-03-72-27
Contract NAS1-10532

Descriptors: *Circuit diagrams, *Electrical properties, *Integrated circuits, *Reliability engineering, *Transistor logic, Beam leads, Logic design, System effectiveness.

For abstract, see STAR 10 19.

N72-28249 PC$8.00/MF$0.95
Technische Hochschule Darmstadt (West Germany).
SYNTHESIS OF EQUIVALENT RLC BRIDGES WITH BI-QUADRATIC IMPEDANCE FUNCTION AND ITS TRANSFORMATION EQUATIONS IN SERIES-PARALLEL DIPOLES . SYNTHESE AEQUIVALENTER RLC BRUECKEN ZWEIPOLE MIT BIQUADRATISCHER IMPEDANZFUNKTION UND IHRE UMRECHNUNGSBEZIEHUNGEN IN SERIEN-PARALLEL-ZWEIPOLE.
Ph.D. Thesis
G. Dittmer. 8 Jul 71, 120p

Descriptors: *Equivalent circuits, *Network analysis, *Network synthesis, *Rlc circuits, Applications of mathematics, Electrical properties, Numerical analysis.

For abstract, see STAR 10 19.

N72-28250 PC$10.25/MF$0.95
Technische Hochschule Darmstadt (West Germany). Facultat Fuer Elektrotechnik.
TOPOLOGICAL SYNTHESIS AND ANALYSIS OF SYMMETRICAL COUPLING-FREE AND GROUNDED REACTANCE ALL-PASSES, ESPECIALLY OF THE SECOND AND FOURTH ORDER . TOPOLOGISCHE SYNTHESE UND ANALYSE SYMMETRISCHER KOPPLUNGSFREIER UND ERDGEBUNDENER REAKTANZ-ALLPASSE, INSBESONDERE DER ZWEITEN UND VIERTEN ORDNUNG.
Ph.D. Thesis
T. Motz. 8 Jul 71, 165p

Descriptors: *Electric networks, *Network analysis, *Network synthesis, Electrical properties, Equivalent circuits, Numerical analysis.

For abstract, see STAR 10 19.

N72-28251 PC$3.50/MF$0.95
Technische Hochschule, Darmstadt (West Germany).
AN ELECTRONIC DELAY AND COMPRESSION METHOD FOR FREQUENCY AND TIME LIMITED ANALOG SIGNALS . EIN VERFAHREN ZUR ELEKTRONISCHEN DEHNUNG UND STAUCHUNG FREQUENZ- UND ZEITBEGRENZTER ANALOGSIGNALE.
Ph.D. Thesis
W. Rychetsky. 26 Feb 71, 29p

Descriptors: *Delay lines, *Pulse time modulation, *Signal transmission, *Velocity modulation, Linear circuits, Pulse amplitude modulation, Pulse compression, Pulse duration modulation.

For abstract, see STAR 10 19.

N72-28497 PC$3.00/MF$0.95
General Electric Co., Syracuse, N.Y. Electronics Lab.
DEVELOPMENT OF CHIP PASSIVATED MONOLITHIC COMPLEMENTARY MISFET CIRCUITS WITH BEAM LEADS.
Final Report, 12 Nov. 1970 - 15 May 1972
L. J. Ragonese, M. J. Kim, B. L. Corrie, J. W. Brouillette, and R. E. Warr. 15 May 72, 18p
NASA-CR-123742
Contract NAS8-26498

Descriptors: *Beam leads, *Field effect transistors, *Integrated circuits, *Mis (semiconductors), Chips, Flip-flops, Gates (circuits), Protective coatings, Refractory metals.

For abstract, see STAR 10 19.

N72-28512 PC$5.00/MF$0.95
Stanford Research Inst., Menlo Park, Calif.
INVESTIGATION OF FAILURE MECHANISMS IN INTEGRATED VACUUM CIRCUITS.
A. Rosengreen. Aug 72, 56p NASA-CR-112108
Contracts NAS1-10815, SRI PROJ. PYU-1257

Descriptors: *Failure analysis, *Integrated circuits, Crosstalk, Electrostatic shielding, Thin films, Vacuum effects.

For abstract, see STAR 10 19.

N72-29125 PC$4.50/MF$0.95
Technische Hogeschool, Eindhoven (Netherlands). Dept. of Electrical Engineering.
APERTURE BLOCKAGE IN DUAL REFLECTOR ANTENNA SYSTEMS A REVIEW.
J. Dijk, J. M. Berends, and E. J. Maanders. Sep 71, 48p TH-71-E-23

Descriptors: *Apertures, *Cassegrain antennas, *Sidelobes, *Two reflector antennas, Blocking, Computer programming, Power gain, Sidelobe reduction, Struts, Subreflectors, Support interference.

For abstract, see STAR 10 20.

N72-29168 PC$3.00/MF$0.95
Centre National de La Recherche Scientifique, Toulouse (France). Lab. Dautomatique Et des Ses Applications Spatiales.
FAULT DETECTION METHOD IN SEQUENTIAL SYSTEMS.
P. Azema, M. Courvoisier, and J. P. Richard. 1971, 10p LAAS-PUBL-912

Descriptors: *Error analysis, *Flow nets, *Sequential computers, *Topology, Algorithms, Apexes, Boolean algebra, Equivalent circuits, Flow charts, Trees (mathematics).

For abstract, see STAR 10 20.

N72-29177 PC$3.75/MF$0.95
Centre National de La Recherche Scientifique, Toulouse (France). Lab. Dautomatique Et de Ses Applications Spatiales.
BOOLEAN FUNCTION AND MULTIPLE FAULT TESTING . FONCTION BOOLEENNE ET TEST DES PANNES MULTIPLES.
J. P. Richard. 8 May 72, 32p PUBL-901
Conf- Presented At the Imag Seminar, Grenoble, France, 8 May 1972

Descriptors: *Algorithms, *Boolean functions, *Failure analysis, *Logic circuits, Gates (circuits), Logic design, Network analysis.

For abstract, see STAR 10 20.

N72-29194 PC$10.50/MF$0.95
Alabama Univ., University.
THE USE OF LINEAR PROGRAMMING TECHNIQUES TO DESIGN OPTIMAL DIGITAL FILTERS FOR PULSE SHAPING AND CHANNEL EQUALIZATION.
R. C. Houts, and D. W. Burlage. 19 May 72, 168p NASA-CR-123744, TR-142-102
Contract NAS8-20172

Descriptors: *Data transmission, *Digital filters, *Linear programming, *Pulse time modulation, Channels (data transmission), Optimization, Pulse communication, Pulse frequency modulation.

For abstract, see STAR 10 20.

N72-30140 PC$12.50/MF$0.95
Lockheed Missiles and Space Co., Sunnyvale, Calif.
SPACE STATION HIGH GAIN ANTENNA CONCEPT DEFINITION AND TECHNOLOGY DEVELOPMENT.
Final Report, 16 Jun. 1971 - 16 Jun. 1972
W. D. Wade. 1972, 210p NASA-CR-115759, LMSC/D156878
Contract NAS9-11874

Descriptors: *Directional antennas, *Manned spacecraft, *Space stations, *Structural design, High gain, Quality control, Spacecraft antennas, Subassemblies, Technologies.

For abstract, see STAR 10 21.

N72-30224 PC$8.75/MF$0.95
Harvard Univ., Cambridge, Mass. Div. of Engineering and Applied Physics.
DIFFERENTIAL GEOMETRIC METHODS IN CONTROL.
H. T. Sussmann. 31 Jul 72, 132p NASA-CR-120946
Contracts NGR-22-007-172, N00014-67-A-0298-0006

Descriptors: *Circuits, *Control theory, *Differential geometry, *Network analysis, *Optimal control, Controllability, Electric switches, Matrices (mathematics).

For abstract, see STAR 10 21.

N72-30232 PC$5.00/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MONOLITHIC MICROCIRCUIT TECHNIQUES AND PROCESSES.
B. W. Kennedy. 15 Jun 72, 59p
NASA-TM-X-64687

Descriptors: *Integrated circuits, *Production engineering, *Thin films, Chemical reactions, Dielectrics, Metal films, Metallizing, Silicon dioxide, Silicon nitrides, Sputtering, Vacuum deposition, Vapor deposition.

For abstract, see STAR 10 21.

PB-212 651 PC$3.00/MF$0.95
Acta Polytechnica Scandinavica, Stockholm (Sweden).
A NEW SYNTHESIS METHOD FOR BRANCH-GUIDE DIRECTIONAL COUPLERS.
Electrical engineering series,
Martti Valtonen. 1972, 21p APS-EI-30
Paper copy also available from: The Finnish Academy of Technical Sciences, Lonnrotinkatu 37, 00180 Helsinki 18 (Sweden). Fmk 8.00.

Descriptors: (*Directional couplers, *Network synthesis), Equivalent circuits, Network analysis theory, Sweden.

A narrow-band equivalent circuit for a two-port network consisting of cascaded unit-length lossless transmission lines and lumped or distributed lossless shunt elements between them is obtained by replacing the shunt elements by imaginary conductances. This type of network model may successfully be used in the design of both symmetrical and asymmetrical branch-guide directional couplers. The theoretical performance of the couplers at low coupling levels is in good agreement with the earlier results. An optimum termination impedance ratio giving the minimum VSWR level for fixed directivity and coupling levels is given. (Author)

9F. Telemetry

AD-750 544 PC$3.00/MF$0.95
Oklahoma State Univ Stillwater Research Foundation Electronics Lab
ENGINEERING SUPPORT SERVICES (INSTRUMENTATION FOR AEROSPACE RESEARCH PROGRAM).
Final rept. 10 Jan 70-10 Apr 72,
Richard F. Buck, Robert M. Fike, Donald R. Lynch, John R. Slaughter, and Alan D. Costner. 15 Jul 72, 177p AFCRL-72-0447
Contract F19628-70-C-0147

Descriptors: (*Telemeter systems, *Sounding rockets), Instrumentation, Transponders, Decoding, Antennas, Ground support equipment, Atmospheric sounding.

Activities covered in the report were in support of the Aerospace Research Program of the Air Force Cambridge Research Laboratories. Both personnel and equipment were provided in support of sounding rocket launches at various facilities. Design features for air-borne support packages for a number of these vehicles are presented. The design features of special ground support equipment required in this program, including special purpose PCM decoders and other apparatus, are also included. (Author)

N72-28167 PC$3.00/MF$0.95
Aeronautical Research Labs., Melbourne (Australia).
A SUB-CARRIER OSCILLATOR FOR A MINIATURE TELEMETRY SYSTEM.
M. D. Card. Jan 72, 19p ARL/FL-NOTE-48

Descriptors: *Frequency stability, *Oscillators, *Telemetry, Frequency modulation, Miniature electronic equipment, Signal fading, Signal to noise ratios.

For abstract, see STAR 10 19.

[illegible] PC$3.75/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Brunswick (West Germany). Inst. Fuer Flugfuehrung.
SELF-ADJUSTING LINEARIZING UNITS FOR NONLINEAR SYSTEMS.
W. Schneider. 1972, 33p DLR-FB-72-17
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Comparator circuits, *Linearization, *Nonlinear systems, Frequency modulation, Noise reduction, Telemetry.

For abstract, see STAR 10 19.

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

N72-28920 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AN OUT-OF-CORE VERSION OF A SIX CELL HEAT-PIPE HEATED THERMIONIC CONVERTER ARRAY.
E. W. Kroeger, J. J. Ward, and R. Breitwieser. 1972, 16p NASA-TM-X-68116
Conf- Proposed for Presentation At 7th Intersoc. Energy Conversion Eng. Conf., San Diego, Calif., 25-29 Sep. 1972 Sponsored By the Am. Chem. Soc.

Descriptors: *Heat pipes, *Heat transfer, *Thermionic converters, *Thermodynamic properties, Equipment specifications, Reactor design, Systems engineering.

For abstract, see STAR 10 19.

10B. Power Sources

AD-750 391 PC$3.00/MF$0.95
Army Mobility Equipment Research and Development Center Fort Belvoir Va

THE ADSORPTION AND REACTION OF UNSATURATED CYCLIC HYDROCARBONS ON A FUEL CELL ELECTRODE,
Robert J. York, H. J. Barger, and G. W. Walker. 1972, 10p

Descriptors: (*Fuel cells, Hydrocarbons), (*Hydrocarbons, Electrochemistry), (*Electrochemistry, *Electrodes), Adsorption, Catalysis, Oxidation, Gas chromatography, Cyclopentenes, Molecular orbitals, Molecular isomerism, Carbon dioxide.
Identifiers: Fuel cell electrodes, *Surface chemistry, Chemical reaction mechanisms, *Hydrocarbon air fuel cells, Rearrangement reactions.

Fuel cell researchers have long been interested in the mechanism and catalysis of hydrocarbon oxidation. An unequivocal determination of these processes could provide the insight necessary for the selection and preparation of more efficient and less expensive electrocatalysts; currently a major obstacle to the practical use of direct hydrocarbon oxidation as the anodic reaction in a fuel cell. One approach, described in the report, combines electrochemical techniques with gas phase chromatography to study the electrosorbed intermediates present on a fuel cell electrode during the oxidative process.

N72-29032 PC$3.75/MF$0.95
Florida Univ., Gainesville.
A STUDY OF GAS SOLUBILITIES AND TRANSPORT PROPERTIES IN FUEL CELL ELECTROLYTES.
Semiannual Report, 1 Mar. - 31 Aug. 1971
R. D. Walker. 1 Jun 72, 32p NASA-CR-120984, SAR-12
Contract NGL-10-005-022

Descriptors: *Electrolytic cells, *Gaseous diffusion, *Transport properties, Heat generation, Heat of solution, Temperature measurement, Thermodynamic properties.

For abstract, see STAR 10 20.

N72-29034 PC$7.50/MF$0.95
Gulf General Atomic, San Diego, Calif.
STUDIES OF THERMIONIC MATERIALS FOR SPACE POWER APPLICATIONS.
Summary Report, 1 Aug. 1969 - 7 Dec. 1970
20 Jul 71, 110p NASA-CR-72947, GULF-GA-11035
Contracts NAS3-8504, PROJ. 552

Descriptors: *Service life, *Thermionic converters, *Thermionic emitters, Accelerated life tests, Equipment specifications, Performance tests, Quality control.

For abstract, see STAR 10 20.

N72-30028 PC$6.25/MF$0.95
Pratt and Whitney Aircraft, East Hartford, Conn.
FUEL CELL TECHNOLOGY PROGRAM.
Final Report
27 Apr 72, 82p NASA-CR-128518, PWA-4364
Contract NAS9-11034

Descriptors: *Hydrogen oxygen fuel cells, *Space shuttles, *Systems engineering, Cost analysis, Electrolytes, Potassium hydroxides, Service life.

For abstract, see STAR 10 21.

N72-30029 PC$3.25/MF$0.95
Pratt and Whitney Aircraft, East Hartford, Conn. South Windsor Engineering Facility.
FUEL CELL TECHNOLOGY PROGRAM CONTRACT SUMMARY REPORT.
Summary Report
24 Feb 72, 21p NASA-CR-128519, PWA-4363
Contract NAS9-11034

Descriptors: *Hydrogen oxygen fuel cells, *Technology utilization, Fuel cells, Reliability engineering, Service life.

For abstract, see STAR 10 21.

N72-30031 PC$10.00/MF$0.95
Boeing Co., Seattle, Wash.
AN ADVANCED CONCEPT SECONDARY POWER SYSTEMS STUDY FOR AN ADVANCED TRANSPORT TECHNOLOGY AIRCRAFT.
Final Report
1972, 160P NASA-CR-112103
Contract NAS1-10893

Descriptors: *Auxiliary power sources, *Subsonic aircraft, *Technological forecasting, Aircraft design, Aircraft structures, Research and development.

For abstract, see STAR 10 21.

N72-30033 PC$8.50/MF$0.95
General Electric Co., Philadelphia, Pa. Missile and Space Div.
THE 110 WATT PER KILOGRAM LIGHTWEIGHT SOLAR ARRAY SYSTEM.
Quarterly Report
N. F. Shepard, and A. Schneider. 15 Aug 72, 126p NASA-CR-127889, DOC-72SD4233
Contracts NAS7-100, JPL-953387
Subm- Prepared for Jpl

Descriptors: *Mission planning, *Solar arrays, Booms (equipment), Flexibility, Space stations.

For abstract, see STAR 10 21.

N72-30035 PC$3.00/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
JUNCTION CHARACTERISTICS OF SILICON SOLAR CELLS. PART 1 NONILLUMINATED CASE.
R. J. Stirn. 15 Aug 72, 18p NASA-CR-128029, JPL-TM-33-557-PT-1
Contract NAS7-100

Descriptors: *Electrical properties, *Silicon junctions, *Solar cells, Data acquisition, Equipment specifications, Performance tests.

For abstract, see STAR 10 21.

N72-30036 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
GAS-INJECTION-START AND SHUTDOWN CHARACTERISTICS OF A 2-KILOWATT TO 15-KILOWATT BRAYTON POWER SYSTEM.
D. A. Cantoni. Sep 72, 18p NASA-TN-D-6938, E-6996

Descriptors: *Brayton cycle, *Engine design, *Engine tests, *Gas turbine engines, Computer programs, Numerical analysis, Systems engineering.

For abstract, see STAR 10 21.

N72-30037 PC$4.00/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SOLAR CELL CONTACT PULL STRENGTH AS A FUNCTION OF PULL-TEST TEMPERATURE.
R. K. Yasui, and P. A. Berman. 15 Aug 72, 38p NASA-CR-127888, JPL-TR-32-1563
Contract NAS7-100

Descriptors: *Contact potentials, *Solar cells, Failure analysis, Temperature measurement.

For abstract, see STAR 10 21.

N72-30038 PC$16.25/MF$0.95
General Electric Co., Philadelphia, Pa. Missile and Space Div.
POWER CONDITIONING EQUIPMENT FOR A THERMOELECTRIC OUTER PLANET SPACECRAFT, VOLUME 1, BOOK 1.
Final Technical Report, Apr. 1969 - Dec. 1971
R. E. Andrews. 15 Jun 72, 282p NASA-CR-127914, DIN-72SD4223-VOL-1-BK-1
Contracts NAS7-100, JPL-952536
Subm- Prepared for Jpl

Descriptors: *Outer planets explorers, *Power conditioning, *Tops (spacecraft), Breadboard models, Radioactive isotopes, Systems engineering, Thermoelectric generators.

For abstract, see STAR 10 21.

N72-30039 PC$21.75/MF$0.95
General Electric Co., Philadelphia, Pa. Space Div.
POWER CONDITIONING EQUIPMENT FOR A THERMOELECTRIC OUTER PLANET SPACECRAFT, VOLUME 1, BOOK 2.
Final Technical Report
R. E. Andrews. 15 Jun 72, 395p NASA-CR-127868, DIN-72SD4223-VOL-1-BK-2
Contracts NAS7-100, JPL-952536
Subm- Prepared for Jpl

Descriptors: *Power conditioning, *Tops (spacecraft), Breadboard models, Switching circuits, Systems analysis.

For abstract, see STAR 10 21.

N72-30040 PC$4.75/MF$0.95
Globe-union, Inc., El Monte, Calif.
RESEARCH, DEVELOPMENT AND FABRICATION OF LITHIUM SOLAR CELLS, PART 2.
P. Iles, A. Apr 72, 54p NASA-CR-127483
Contracts NAS7-100, JPL-952546
Subm- Prepared for Jpl

Descriptors: *Electrical properties, *Lithium, *Solar cells, Equipment specifications, Product development, Research projects.

For abstract, see STAR 10 21.

N72-30600 PC$8.75/MF$0.95
NUS Corp., Rockville, Md.
EMITTED RADIATION CHARACTERISTICS OF PLUTONIUM DIOXIDE RADIOISOTOPE THERMOELECTRIC GENERATORS.
P. J. Gingo, and J. J. Steyn. Mar 71, 133p NASA-CR-122414, NUS-772
Contract NAS5-11359

Descriptors: *Plutonium oxides, *Radioactive isotopes, *Radioactivity, Gamma rays, Neutron flux density, Thermionic power generation.

For abstract, see STAR 10 21.

10C. Energy Storage

AD-750 719 PC$3.00/MF$0.95
Massachusetts Univ Amherst School of Engineering
A HIGH ENERGY DENSITY STORAGE SYSTEM WITH ENCAPSULATED SILVER--ZINC CELLS FOR DEEP OCEAN APPLICATIONS,
William A. Birtcher, and William E. Heronemus. Aug 72, 171p Rept no. UM-72-10
Contract N00014-68-A-0146

Descriptors: (*Storage batteries, *Deep submergence), Oceanographic vessels, Zinc, Silver, Design, Reliability (Electronics), Packaging.
Identifiers: *Deep ocean vehicles, *Silver zinc cells, Zinc cells.

The investigation was concerned with the design of a high energy density storage system for deep

ocean applications. A sampling of available storage cells is presented and their properties compared with those of the silver-zinc cell. The concept of packaging large numbers of silver-zinc batteries in small glass spheres is then developed, and systems capable of positive, neutral, or negative buoyancy are shown. These individual battery packages were integrated into complete electrical systems and the manner in which they are to be carried by a deep submergence vessel (DSV) is shown. Finally, the advantages of the pressure-proof silver-zinc system are demonstrated by means of a comparison with the popular pressure-compensated system. (Author)

AD-751 018 PC$3.00/MF$0.95
Naval Ordnance Lab White Oak Md
LIST OF BATTERIES FOR U. S. NAVAL WEAPONS,
Benjamin F. Larrick. 28 Sep 72, 36p Rept no. NOLTR-72-213

Descriptors: (*Batteries + components, Catalogs), (*Weapon systems, Batteries + Components), Bombs, Depth charges, Mines (Ordnance), Destructors, Projectiles, Guided missiles, Rockets, Torpedoes, Electrochemistry, Thermal batteries, Naval research.
Identifiers: Propulsion batteries, Mercury batteries.

A list of the batteries used in U. S. Naval weapons under the cognizance of the Naval Ordnance Systems Command is presented. This list is cross-referenced with the weapons in which these batteries are used. The Federal Stock Number, specification and drawing numbers, manufacturer, and electrochemical system are given for each battery. (Author)

N72-28567 PC$3.25/MF$0.95
Techtran Corp., Glen Burnie, Md.
PROJECT HELIOS INVESTIGATION OF ADHESIVES WITH RESPECT TO HEAT RESISTANCE AND WEIGHT.
J. Schneider, D. Scheel, and H. W. Boller. Mar 72, 24p NASA-TT-F-14158, BMBW-FB-W-71-16
Contract NASW-2037
Tran- Transl. Into English of West German Rept. Bmbw-fb-w-71-16 Dated Apr. 1971 35 P

Descriptors: *Adhesives, *Performance tests, *Solar cells, *Thermal resistance, Space environment simulation, Structural members, Weight (mass).

For abstract, see STAR 10 19.

N72-30030 PC$7.50/MF$0.95
Eagle-picher Co., Joplin, Mo. Couples Dept.
STUDY OF PROCESS VARIABLES ASSOCIATED WITH MANUFACTURING HERMETICALLY-SEALED NICKEL-CADMIUM CELLS.
Quarterly Report, Mar. - May 1971
L. Miller. May 72, 107p NASA-CR-122454, QR-5
Contract NAS5-21159

Descriptors: *Nickel cadmium batteries, *Production engineering, *Spacecraft power supplies, Chemical analysis, Electron microscopes, Reliability engineering, Specifications.

For abstract, see STAR 10 21.

N72-30032 PC$8.50/MF$0.95
Tyco Labs., Inc., Waltham, Mass.
NICD BATTERY ELECTRODES.
Final Report
G. Holleck, M. Turchan, and J. Hopkins. May 72, 127p NASA-CR-127890
Contracts NAS7-100, JPL-953185
Subs- Prepared for Jpl

Descriptors: *Electrodes, *Nickel cadmium batteries, Cathodes, Silver compounds, Sintering, Teflon (trademark).

For abstract, see STAR 10 21.

11. MATERIALS

11A. Adhesives and Seals

AD-750 571 PC$8.00/MF$08.00
Hughes Aircraft Co Culver City Calif Electronic Properties Information Center
PROPERTIES OF OPTICALLY TRANSPARENT ADHESIVES.
Interim rept.,
Walter H. Veazie, Jr. Jun 72, 109p* Rept no. EPIC-IR-76-Rev
Contract DSA900-72-C-1182

Descriptors: (*Adhesives, Physical properties), Optical properties, Conductivity, Mechanical properties, Thermal properties, Light transmission, Refractive index, Radiation damage.

Optical, electrical, mechanical and thermal properties data for fifty commercially available transparent optical adhesives are given. Transmission, refractive index, radiation effects and limited processing data are also included. The data were selected from manufacturers, journal and government report literature. Ninety-six references are given in addition to a list of manufacturers of transparent optical adhesives. (Author)

AD-750 814 PC$3.00/MF$0.95
Monsanto Research Corp Dayton Ohio Dayton Lab
ENGINEERING DATA ON ETHYLENE TERPOLYMER AS AN ADHESIVE FOR POLYCARBONATE COMPOSITE AIRCRAFT TRANSPARENCIES.
Technical rept. Feb 71-Apr 72,
George L. Ball, III, I. O. Salyer, C. J. North, and P. H. Wilken. Jul 72, 44p Rept no. MRC-DA-332 AFML-TR-72-109
Contract F33615-71-C-1321

Descriptors: (*Adhesives, *Polyethylene plastics), (*Windshields, Laminates), (*Laminates, Adhesives), Laminated glass, Laminated plastics, Optimization, Crosslinking (Chemistry), Thermoplastics, Mechanical properties, Tensile properties, Impact tests, Creep, Extrusion, Production, Light transmission.
Identifiers: Ethylene terpolymers, *Polycarbonate resins, Dissimilar materials bonding, *Aircraft windows.

A transparent ethylene terpolymer adhesive was optimized and engineering data established to describe its utility in polycarbonate composite aircraft transparencies. The hydroxyl content was adjusted to provide for the best balance of toughness and adhesion versus elongation. Improvements in toughness were also derived through increases in molecular weight of the ethylene terpolymer by the use of heretofore unavailable materials and processes. It was shown that a higher level of hydroxyl (3.4%) in the terpolymer would be desirable. Primarily, by the use of partial crosslinking, the form-stable temperature (zero tensile strength) was increased to 178F. Most significant, however, was the excellent mechanical performance of material designated ETA 138200 over the spectrum of temperature from -65F to +165F. (Author)

N72-30580 PC$3.00/MF$0.95
Houston Research, Inc., Tex.
THERMAL CONDUCTIVITY OF FILLED RTV COMPOUNDS.
Final Report
C. E. Mauk. 24 Jul 72, 20p NASA-CR-128520
Contract NAS9-6698

Descriptors: *Conductive heat transfer, *Thermal conductivity, *Vulcanizing, Cooling systems, Heat sinks, Oxides.

For abstract, see STAR 10 21.

11B. Ceramics, Refractories, and Glasses

AD-750 431 Reprint
Owens-Illinois Inc Toledo Ohio
THE NUCLEATION PROCESS IN THE METASTABLE REGION IN A NA20-SI02 GLASS,
G. F. Neilson. 1972, 9p AFOSR-TR-72-1983
Contract AF49 (638)-1701
Availability: Pub. in Physics and Chemistry of Glasses, v13 n3 p70-76 Jun 72.

Descriptors: (*Glass, *Nucleation), Silicon dioxide, Sodium compounds, Oxides, Phase studies, Heat treatment.
Identifiers: Sodium oxides.

In a Na20-Si20 glass containing 12.6 mo1% Na20, the kinetics of phase separation (through the nucleation, growth, and coarsening processes) were studied by small angle x-ray scattering and electron microscopy. The investigation was made at two temperatures in the metastable region of the phase diagram, 770 and 790C. For interpretation, emphasis is placed on the measured variation of the particle size and I (0) scattering parameters as a function of time. It was concluded, that the various separation processes can be distinguished by the procedure employed and that the initial nucleation process is related to the high degree of decomposition of the initial glass. (Author)

AD-750 534 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
INTENSIVE WEAR OF GRAPHITE MATERIALS,
L. A. Plutalova, and Z. A. Panyusheva. 11 Aug 72, 14p Rept no. FTD-MT-24-293-72
Edited machine trans. of Mashinovedenie (USSR) n4 p112-116 1970, by Rene E. Courville.

Descriptors: (*Graphite, Wear resistance), Friction, Pressure, USSR.
Identifiers: Translations.

Graphite wears in two different ways in friction with metal, depending on the specific applied pressure. Below a certain 'critical level, the wear is slow: above this critical level, friction and wear increase markedly. Study of the process of wear under high loads shows that the wear rate and friction vary in the same manner with various variable parameters for all metal graphite pairs. There is a critical value of specific pressure for each graphite metal pair, at which the transition from slight to intensive wear occurs. (Author)

AD-750 913 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
EFFECT OF LIQUID MEDIUM ON THE FRICTION OF GRAPHITE,
L. B. Krisanova, V. D. Belogorskii, and S. I. Kontarovich. 25 Aug 72, 10p Rept no. FTD-HC-23-0991-72
Unedited rough draft trans. of Konstruksionnye Materialy na Osnova Grafita (USSR) n5 p158-163 1970.

Descriptors: (*Graphite, Wear resistance), Liquids, Friction, Adsorption, Surface properties, Organic solvents, Wetting, Water, USSR.
Identifiers: Translations.

The purpose of the article is analysis of the wear resistance of graphite during friction in inert liquid with various chemical affinity for graphite, for instance with various boundary wetting angles of graphite. (Author)

AD-885 295 PC$12.75/MF$0.95
ManLabs., Inc., Cambridge, Mass.
STABILITY CHARACTERIZATION OF REFRACTORY MATERIALS UNDER HIGH VELOCITY ATMOSPHERIC FLIGHT CONDITIONS. PART V. VOLUME I. ADDITIONAL STUDIES.
Technical rept. Nov 69-Dec 70,
Larry Kaufman, and Harvey Nesor. Apr 71, 214p
AFML-TR-69-84-Pt-5-Vol-1
Contract AF 33 (615)-3859
Distribution Limitation now Removed.

Descriptors: (*Refractory materials, *Oxidation), (*Atmosphere entry, Refractory materials), Refractory coatings, Hypersonic flow, Borides, Graphite, Composite materials, Carbides, Tungsten alloys, Zirconium alloys, Microstructure, Solid solutions, Refractory metal alloys, Copper alloys, Silicon carbides, Zirconium oxides, Nitrides, Tantalum alloys, Plasma medium, Heat transfer, Heat flux, Surfaces.
Identifiers: Graphite composites, Zirconium borides, Silicon nitrides.

The oxidation of refractory borides, graphites and /T composites, hypereutectic carbide-graphite composites, refractory metals, coated refractory metals over the extensive spectrum of environmental conditions encountered during reentry or high velocity atmospheric flight, as well as those employed in furnace tests was studied. (Author)

N72-28564 PC$9.75/MF$0.95
North American Rockwell Corp., Downey, Calif. Space Div.
STUDY OF THE PRODUCTION OF UNIQUE NEW GLASSES.
Final Report
R. A. Happe. 13 Jun 72, 153p NASA-CR-123740, SD-72-SA-0083
Contract NAS8-28014

Descriptors: *Glass, *Melting, *Production engineering, *Weightlessness, Induction heating, Laser heating, Optical properties, Product development.

For abstract, see STAR 10 19.

N72-29565 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EVALUATION OF OXIDATION RESISTANT NONMETALLIC MATERIALS AT 1204 C (2200 F) IN A MACH 1 BURNER.
W. A. Sanders, and H. B. Probst. Aug 72, 27p
NASA-TN-D-6890, E-6918

Descriptors: *Gas flow, *High temperature environments, *Refractory materials, *Thermodynamic properties, Materials tests, Oxidation, Temperature effects.

For abstract, see STAR 10 20.

N72-30953 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
NUMERICAL ANALYSIS OF THE TRANSIENT RESPONSE OF AN AXISYMMETRIC ABLATIVE CHAR LAYER CONSIDERING INTERNAL FLOW EFFECTS.
C. M. Pittman, and L. M. Howser. Sep 72, 62p
NASA-TN-D-6895, L-7868

Descriptors: *Ablative materials, *Charring, *Numerical analysis, *Transient response, Differential equations, Digital computers, Gas flow, Pyrolysis.

For abstract, see STAR 10 21.

11C. Coating, Colorants, and Finishes

AD-750 517 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
PLASMA BABBITT SURFACING OF THE STEEL BASE OF BEARINGS,
M. V. Bruk, and V. B. Khmelevskaya. 25 Aug 72, 8p Rept no. FTD-HC-23-0882-72
Unedited rough draft trans. of Institut Vodnogo Transporta, Leningrad. Trudy (USSR) n126 p49-52 1971.

Descriptors: (*Metal coatings, *Electrodeposition), (*Bearings, Metal coatings), Cleaning, Etching, Ion bombardment, Alloys, Finishes + finishing, USSR.
Identifiers: Translations, Bearing alloys, *Arc spraying, *Plasma spraying.

The authors suggest the use of an alternating current plasma arc for preparing a surface just before pouring (in this case, the surface is cleaned by the so called ion etching process) and for facing the bearing's framework with babbitt. This process eliminates the laborious operation of cleaning the surface. The quality of the babbitt deposited by the plasma arc and its adhesion strength are not inferior to those characteristics obtained by the usual method. (Author)

AD-750 525 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
LINING OF HYDROSTATIC BEARINGS WITH SELF-SETTING PLASTIC AST-T,
A. S. Efoyan. 21 Aug 72, 8p Rept no. FTD-HT-23-781-72
Edited trans. of Samoletostroeniya i Tekhnika Vozdushnogo Flota (USSR) n22 p141-143 1970, by Victor Mesenzeff.

Descriptors: (*Plastic coatings, *Bonding), (*Gas bearings, *Precision finishing), Composite materials, Metal joints, Bonded joints, Adhesion, Tolerances (Mechanics), Plastics, USSR.
Identifiers: Translations.

Self curing AST-T resin had good antifriction properties, wear resistance and adhesion to steel, brass, and Al, and was therefore suited for lining hydrostatic bearings. Adhesion of AST-T to steel was improved by adding 20% methacrylic acid to the composition, but decreased with 30% graphite or powdered Al fillers. (Author)

AD-750 533 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE INFLUENCE OF SOME GALVANIC AND THERMODIFFUSIVE COATINGS ON THE DURABILITY OF SHAFTS AND HINGED JOINTS,
V. S. Pavlenko, and G. A. Preis. 4 Aug 72, 11p Rept no. FTD-MT-24-109-72
Edited machine trans. of Tekhnologiya i Organizatsiya Proizvodstva (USSR) n4 p27-29 1970, by Charles T. Ostertag, Jr.

Descriptors: (*Coatings, Wear resistance), Metal coatings, Diffusion coating, Chromizing, Bushings, Steel, Anodic coatings, Metal joints, USSR.
Identifiers: Translations.

The effect of certain galvanic and thermodiffusive coatings on the wear resistance of parts of low load high speed hinged assemblies in rocker motion is described. (Author)

AD-750 568 PC$3.00/MF$0.95
Army Coating and Chemical Lab Aberdeen Proving Ground Md
STUDY OF INHIBITIVE PIGMENTS FOR IMPROVED CORROSION RESISTANCE IN LUSTRELESS ONE COAT AMMUNITION ENAMELS.
Progress rept.,
Merrill Cohen, Andrew A. O'Brochta, and Melvin H. Sandler. Aug 72, 32p Rept no. CCL-313

Descriptors: (*Ceramic coatings, *Ammunition), Corrosion inhibition, Pigments, Environmental tests.

One coat ammunition enamels covered by Specification TT-E-516, 'Enamel, Lustreless, Quick Drying, Styrenated Alkyd Type' were reformulated with white low tint strength inhibitive type pigmentations. The enamels were subject to salt spray tests and exterior exposure at temperate and tropical zone sites. The data shows several of the experimental enamels will provide significantly improved corrosion resistance over the standard enamels. (Author)

AD-750 644 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
EFFECT OF TECHNOLOGICAL PARAMETERS ON THE ANTIFRICTION PROPERTIES OF CAPRON COATINGS,
Z. A. Melkonyan, and Kh. A. Rushanyan. 5 Aug 72, 11p Rept no. FTD-HT-23-175-72
Edited trans. of Promyshlennost Armenii (USSR) v11 n6 p36-38 1969, by R. J. Zeccola.

Descriptors: (*Nylon coatings, Wear resistance), Friction, Bearings, Gears, Molding, USSR.
Identifiers: Translations.

The optimum pressure molding conditions were determined for the manufacture of kapron coated metal bearings and unlubricated gears of agricultural machinery in order to minimize their wear and friction coefficient. (Author)

AD-750 718 PC$3.00/MF$0.95
Massachusetts Univ Amherst School of Engineering
CATALYST COATINGS APPLIED BY PLASMA SPRAYING FOR THE LOW PRESSURE POLYMERIZATION OF ETHYLENE,
Timothy J. Koska, John E. Ritter, Jr., Robert H. Kirchhoff, and John W. Eldridge. Jul 72, 89p*
Rept no. UM-72-7
Contract N00014-68-A-0146

Descriptors: (*Ceramic coatings, *Catalysts), (*Polymerization, Catalysts), (*Ethylenes, Polymerization), Plasma jets, Silicon dioxide, Alumina, Substrates, Thickness, Bonding, Impregnation, Chromium compounds, Oxides, Feasibility studies, Electron microscopy, Surface properties, Optimization, Thermal shock.
Identifiers: *Plasma spraying, Coating processes, *Sprayed coatings, Chromium oxides, Scanning electron microscopy.

Silica-alumina cracking catalyst was plasma sprayed onto a metal substrate to attempt to develop a unique catalyst support form for ethylene polymerization. Seven plasma spraying parameters were optimized using a sequential analysis conducted on an accumulation of information basis. These parameters included five plasma gun operating variables and two material variables. The coating withstood the heating and cooling cycle associated with polymerization but could tolerate only 15 cycles in the thermal shock test. Temperature-time curves for various specimen thicknesses were determined. Coating adherence was achieved when the catalyst support-substrate temperature was kept below 600F. The feasibility of using the bonded support impregnated with chromium oxide as the catalyst in low pressure polymerization of ethylene was investigated. the bonded catalyst was not active and failed to produce polyethylene under the conditions studied.

PAT-APPL-273223 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PROCESS FOR PRODUCING NICKEL ALUMINIDE COATING LOW ALLOY STAINLESS STEEL.
Patent Application
S. J. Grisaffe, and E. W. Klechka. Filed 19 Jul 72, 12p NASA-CASE-LEW-11267-2
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Austenitic stainless steels, *Corrosion resistance, *Erosion, *Internal combustion engines, *Protective coatings, Automobile engines, Flame spraying, Heat resistant alloys, Oxidation resistance, Patent applications.

A process is described for coating low alloy austenitic stainless steel to render the steel highly resistant to oxidation corrosion and erosion from exhaust gases in automobile internal combustion engines. The process involves placing a cementation pack, made up of 96% aluminum oxide, 2% aluminum, 1% soldium chloride, and 1% ammonium bifluoride, on the nickel chromium layer in an inert atmosphere. The cementation pack is allowed to remain on the nickel chromium layer between 4 and 24 hours at temperatures from 1400 to 1600 F. This process forms an intermetallic chromium containing nickel aluminide that renders the steel highly resistant to erosion and oxidation.

N72-28544 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CYCLIC OXIDATION OF COBALT-CHROMIUM-ALUMINUM-YTTRIUM AND ALUMINIDE COATINGS ON IN-100 AND VIA ALLOYS IN HIGH VELOCITY GASES.
D. L. Deadmore. Jul 72, 36p NASA-TN-D-6842, E-6809

Descriptors: *Aluminum coatings, *Cobalt compounds, *Heat resistant alloys, *Oxidation resistance, *Protective coatings, Crack propagation, Nickel alloys, Performance, Thermal fatigue.

For abstract, see STAR 10 19.

N72-28572 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ACHIEVEMENT OF A LOW-OUTGASSING WHITE PAINT SYSTEM FOR SPACECRAFT THERMAL CONTROL.
B. Seidenberg, J. J. Park, and C. Clatterbuck. Aug 72, 18p NASA-TN-D-6892, G-1067

Descriptors: *Outgassing, *Paints, *Potting compounds, *Temperature control, Polymerization, Thermal cycling tests.

For abstract, see STAR 10 19.

N72-29570 PC$4.50/MF$0.95
Ministry of Defence, London (England).
FACTORS AFFECTING THE ELECTRODEPOSITION OF PAINTS ON AIRCRAFT ALLOYS.
G. A. Dunn. Aug 71, 47p D-MAT/AV-175
Contract KS/1/0503/C.B.43 (A)2

Descriptors: *Aluminum alloys, *Electrodeposition, *Magnesium alloys, *Paints, Aircraft structures, Anodizing, Chromates, Pigments, Protective coatings, Resins, Salt spray tests, Surface finishing.

For abstract, see STAR 10 20.

N72-30583 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
QUANTITATIVE X-RAY DIFFRACTION ANALYSIS OF OXIDES FORMED ON SUPERALLOYS.
R. G. Garlick. Sep 72, 14p NASA-TM-X-2627, E-6911

Descriptors: *Oxides, *Quantitative analysis, *X ray diffraction, Cobalt alloys, Heat resistant alloys, Oxidation, Spalling.

For abstract, see STAR 10 21.

11D. Composite Materials

AD-750 353 PC$3.00/MF$0.95
Army Materials and Mechanics Research Center Watertown Mass
FABRICATION OF NEW COMPOSITE MATERIALS,
James W. McCauley. 1972, 15p

Descriptors: (*Alumina, *Composite materials), (*Mica, *Reinforcing materials), Mechanical properties, Density, Hot pressing, Aluminates, Magnesium compounds, Eutectics, Hardness, Flexural strength.
Identifiers: Eutectic composites.

The feasibility of fabricating lamellar ceramic-based composites with synthetic fluorine mica has been demonstrated. Ba-mica/Al2O3 composites with greater than 99.5% of theoretical density have been produced. If the thermal shock resistance of these materials is also enhanced, potential applications include structural components in turbine engines and high temperature bearings. Reactive hot-pressing of K-mica with gamma-Al2O3 showed that fully dense K-mica/Al2O3 composites are not feasible by hot-pressing up to 7000 psi. The work did demonstrate, however, that this technique allows for the fabrication of eutectic-like MgAl2O4/Al2O3 composites 700 C below the eutectic temperature.

AD-750 367 PC$3.00/MF$0.95
Watervliet Arsenal N Y
STRESS SINGULARITIES ASSOCIATED WITH A CRACK INCLINED TO A BIMATERIAL INTERFACE,
San L. Pu, Raymond D. Scanlon, and Moayyed A. Hussain. 1972, 15p

Descriptors: (*Composite materials, Cracks), (*Cracks, Stresses), Interfaces, Numerical analysis, Elasticity, Fracture (Mechanics).

The purpose of the paper is to investigate the nature of the stress singularities associated with a crack inclined to a bimaterial interface. Emphasis is placed on the stress singularities since it was precisely the order of singularity in the homogeneous material that led to the definitions of stress intensity factors and fracture toughness. (Author

AD-750 498 PC$3.00/MF$0.95
California Univ San Diego La Jolla Dept of Applied Mechanics and Engineering Sciences
TWO-DIMENSIONAL ELASTIC STRESSES AROUND A CRACK NORMAL TO AN INTERFACE.
Technical rept.,
Noel E. Ashbaugh. Aug 72, 25p Rept no. TR-7 AFOSR-TR-72-2005
Grant AF-AFOSR-1957-70

Descriptors: (*Composite materials, Cracks), (*Cracks, Stresses), Interfaces, Fracture (Mechanics), Interactions, Mathematical analysis.

Mode 2 or shearing mode stress intensity factors are determined for a finite length crack in a bimaterial composite. The crack is in one of the elastic materials and is perpendicular to an interface between the two bonded dissimilar materials of the composite. The mode 2 factors, together with previously obtained mode 1 factors, furnish the complete two-dimensional description of the stresses around the crack tips for in-plane loads on the composite. Numerical results for the stress intensity factors are presented for a stress-free crack which occurs in a region of uniform stress. (Author)

AD-750 584 PC$3.00/MF$0.95
California Univ San Diego La Jolla Dept of Applied Mechanics and Engineering Sciences
A CONTINUUM THEORY FOR WAVE PROPAGATION IN LAMINATED COMPOSITES. CASE 2: PROPAGATION PARALLEL TO THE LAMINATES.
Technical rept.,
G. A. Hegemier, and T. C. Bache. Jul 72, 35p Rept no. TR-6 AFOSR-TR-72-2012
Grant AF-AFOSR-1957-70

Descriptors: (*Composite materials, Mechanical waves), Laminates, Wave transmission, Elasticity, Shear stresses, Deformation, Boundary value problems, Continuum mechanics.

A continuum theory with microstructure for wave propagation in laminated composites, proposed in a previous work concerning normal propagation, is extended herein to the case of propagation parallel to the laminates. Model construction is based upon an asymptotic scheme in which dominant signal wavelengths are assumed large compared to typical composite microdimensions. A hierarchy of models is defined by the order of truncation of the obtained asymptotic sequence. To estimate accuracy, the phase velocity spectrum is investigated. As in the previous case, retention of all terms in the asymptotic sequence is found to yield the exact spectrum of Rytov. Spectral collation of the lowest order dispersive theory with exact first mode data gives excellent agreement. Based upon asymptotic expansions, a simplified first-order theory is also developed. (Author)

AD-750 764 PC$3.00/MF$0.95
General Motors Corp Indianapolis Ind Detroit Diesel Allison Div
BERYLLIUM REINFORCED METAL MATRIX COMPOSITES STUDY PROGRAM.
Final rept. 24 Jun 71-24 May 72,
Robert W. Stusrud, Morris J. Tumey, Marvin Herman, and G. R. Sippel. Aug 72, 54p Rept no. DDAD-EDR-7518
Contract N00019-71-C-0324

Descriptors: (*Composite materials, Titanium alloys), (*Reinforcing materials, *Beryllium), (*Non-destructive testing, Composite materials), Extrusion, Ultrasonic radiation, Airfoils, Mechanical properties, Aluminum alloys, Vanadium alloys, Microstructure.
Identifiers: *Beryllium reinforced composites, Titanium alloy 6Al 4V.

The program aimed to develop nondestructive inspection techniques for beryllium-titanium composites and to characterize beryllium-titanium composites fabricated by different techniques. The feasibility of producing sheet, tubes, bars and forging preforms of Be/Ti 6Al-4V composite material was demonstrated. (Author)

AD-750 778 PC$3.00/MF$0.95
Douglas Aircraft Co Long Beach Calif
DEVELOPMENT OF A GRAPHITE HORIZONTAL STABILIZER.
Interim technical rept. 1 Nov 71-30 Jun 72,
George M. Lehman. Jul 72, 100p Rept no. MDC-J5621
Contract N00156-70-C-1321

Descriptors: (*Stabilizers (Horizontal tail surface), Graphite), (*Attack bombers, Stabilizers (Horizontal tail surface)), Jet bombers, Composite materials, Epoxy plastics, Vibration, Frequency, Aerodynamic configurations, Naval aircraft, Damping, Flutter, Test methods, Aerodynamic loading, Metal plates.

Identifiers: *Epoxy graphite composites, A-4 aircraft.

Vibration and static test setups are described and results are presented for a graphite-epoxy stabilizer assembly for the A-4 Skyhawk aircraft. Natural vibration frequencies, mode shapes, and structural damping data are presented for both the graphite stabilizer and the analogous production metal stabilizer. Each configuration was tested both with and without the production elevator installed. Structural influence coefficients were derived from the vibration test results and used to analyze the flutter speed of the A-4 aircraft using the graphite stabilizer. The flutter characteristics of the graphite stabilizer are expected to be improved, with the flutter speed being increased by 22 percent. The reduced weight of the graphite stabilizer is not expected to have a significant effect on the fin flutter characteristics. The stabilizer was tested statically under two critical load conditions, a localized leading-edge condition and an unsymmetrical bending condition. Finite element analyses are expected to determine the magnitudes of secondary sheares and bending moments through the thickness of the laminate and their influences on ultimate strength of the stabilizer. (Author)

AD-750 983 PC$3.25/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
ELASTIC WAVES IN REINFORCED MATERIALS.
15 Sep 72, 21p Rept no. FTD-HT-23-1382-72
Edited trans. of mono., Composite Fibrous Materials, Kiev, 1970 p127-137, by John A. Miller.

Descriptors: (*Composite materials, Mechanical waves), Viscoelasticity, Wave transmission, Shear stresses, USSR.
Identifiers: Translations, Fiber composites.

The article concerns elastic waves in reinforced materials. It studies waves in anisotropic viscoelastic medium, energy dissipation in a reinforced medium, longitudinal shear waves, and longitudinal propagation of elastic waves. (Author)

N72-28545 PC$3.25/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
MATERIAL AND STRUCTURAL STUDIES OF METAL AND POLYMER MATRIX COMPOSITES.
R. A. Signorelli, T. T. Serafini, and R. H. Johns. 1972, 23p NASA-TM-X-68101, E-7020
Conf- Proposed for Presentation At Symp. on Impact of Composite Mater. on Aerospace Vehicles and Propulsion Systems, Toulouse, 20-22 Sep. 1972 Sponsored By the Advisory Group for Aerospace Res. and Develop.

Descriptors: *Composite materials, *Metal matrix composites, *Polymers, *Reinforcing fibers, Aircraft structures, Dynamic structural analysis, Spacecraft structures, Structural design.

For abstract, see STAR 10 19.

N72-28569 PC$4.00/MF$0.95
Princeton Univ., N.J. Dept. of Aerospace and Mechanical Sciences.
EROSION OF GRAPHITE SURFACE EXPOSED TO HOT SUPERSONIC HYDROGEN GAS.
O. P. Sharma. 27 Jun 72, 36p NASA-CR-127636
Contract NGR-31-001-230
Subm- Backup Document for Aiaa Synoptic, Erosion of Graphite Surface Exposed To High Temperature Supersonic Hydrogen Gas, Scheduled for Publication in Journal of Spacecraft and Rockets in Nov. 1972

Descriptors: *Erosion, *Graphite, *High temperature gases, *Laminar boundary layer, Flow equations, Hydrogen, Isentropic processes, Mathematical models, Nozzle flow, Supersonic flow.

For abstract, see STAR 10 19.

N72-28570 PC$3.50/MF$0.95
Lehigh Univ., Bethlehem, Pa. Inst. of Fracture and Solid Mechanics.
A LAYERED COMPOSITE WITH A BROKEN LAMINATE.
G. D. Gupta. Jun 72, 28p NASA-CR-127686, IFSM-72-19
Contracts NGR-39-007-011, NSF GK-11977

Descriptors: *Composite materials, *Cracking (fracturing), *Integral transformations, *Laminates, *Stress concentration, Numerical analysis, Problem solving, Stress analysis.

For abstract, see STAR 10 19.

N72-28571 PC$5.00/MF$0.95
Lehigh Univ., Bethlehem, Pa.
FRACTURE PROBLEMS IN COMPOSITE MATERIALS.
F. Erdogan. Apr 72, 60p NASA-CR-127700, NASA-TR-72-2
Contracts NGR-39-007-011, NSF GK-11977

Descriptors: *Composite materials, *Crack propagation, *Fracture mechanics, *Stress tensors, Fatigue (materials), Numerical analysis, Stress analysis.

For abstract, see STAR 10 19.

N72-29598 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ADDITION-TYPE POLYIMIDES FROM SOLUTIONS OF MONOMERIC REACTANTS.
P. Delvigs, T. T. Serafini, and G. R. Lightsey. Aug 72, 21p NASA-TN-D-6877, E-6750

Descriptors: *Composite materials, *Graphite, *Mechanical properties, *Polyimides, *Thermal stability, Chemical reactions, Monomers, Polymers, Reinforcing fibers.

For abstract, see STAR 10 20.

N72-29602 PC$4.25/MF$0.95
Explosives Research and Development Establishment, Waltham Abbey (England).
GLASS FILLED THERMOPLASTICS EFFECTS OF GLASS VARIABLES AND PROCESSING ON PROPERTIES.
R. W. Richards, and D. Sims. Jan 72, 41p
ERDE-TR-88, BR-29467

Descriptors: *Glass fibers, *Nylon (trademark), *Polypropylene, *Polystyrene, *Reinforced plastics, Modulus of elasticity, Silanes, Tensile properties, Thermoplastic resins.

For abstract, see STAR 10 20.

N72-29689 PC$19.75/MF$0.95
Oklahoma Univ., Norman. School of Aerospace, Mechanical and Nuclear Engineering.
IN-PLANE, FLEXURAL, TWISTING AND THICKNESS-SHEAR COEFFICIENTS FOR STIFFNESS AND DAMPING OF A MONOLAYER FILAMENTARY COMPOSITE, PART 1.
Final Report
C. W. Bert, and S. Chang. Mar 72, 355p
NASA-CR-112141
Contract NGR-37-003-055

Descriptors: *Composite materials, *Damping, *Dynamic structural analysis, *Elastic properties, *Filaments, Materials tests, Numerical analysis, Vibration measurement.

For abstract, see STAR 10 20.

N72-30471 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
REVIEW OF STATUS AND POTENTIAL OF TUNGSTEN-WIRE SUPERALLOY COMPOSITES FOR ADVANCED GAS TURBINE ENGINE BLADES.
R. A. Signorelli. Sep 72, 23p NASA-TM-X-2599, E-7020

Descriptors: *Composite materials, *Heat resistant alloys, *Refractory materials, *Turbine blades, Aircraft engines, Mechanical properties, Product development.

For abstract, see STAR 10 21.

N72-30495 PC$27.75/MF$0.95
Mcdonnell-douglas Co., Huntington Beach, Calif. Advance Propulsion Dept.
DEVELOPMENT OF LIGHTWEIGHT MATERIAL COMPOSITES TO INSULATE CRYOGENIC TANKS FOR 30-DAY STORAGE IN OUTER SPACE.
Final Report
D. R. Krause. Jun 72, 515p NASA-CR-123797, MDC-G2742
Contract NAS8-26006

Descriptors: *Cryogenic fluid storage, *Multilayer insulation, *Reusable spacecraft, *Space storage, Atmospheric entry, Composite materials, Heat transfer.

For abstract, see STAR 10 21.

N72-30499 PC$3.00/MF$0.95
Materials Sciences Corp., Blue Bell, Pa.
TENSILE FAILURE CRITERIA FOR FIBER COMPOSITE MATERIALS.
B. W. Rosen, and C. H. Zweben. Aug 72, 167p NASA-CR-2057
Contract NAS1-10134

Descriptors: *Composite materials, *Failure, *Fiber strength, *Tensile properties, Failure modes, Mathematical models, Structural design.

For abstract, see STAR 10 21.

11E. Fibers and Textiles

AD-750 773 PC$3.00/MF$0.95
Stanford Research Inst Menlo Park Calif
THE FIRE RETARDANCE EFFECTIVENESS OF HIGH MOLECULAR WEIGHT, HIGH OXYGEN CONTAINING INORGANIC ADDITIVES IN CELLULOSIC AND SYNTHETIC MATERIALS.
Annual rept.,
Anne E. Lipska. Aug 72, 66p
Contract DAHC20-70-C-0219

Descriptors: (*Fire resistant materials, *Wood), (*Fire resistant textiles, Test methods), Effectiveness, Protective treatments, Additives, Molybdenum compounds, Tungsten compounds, Tungstates, Ammonium compounds, Phosphates, Cotton textiles, Rayon, Nylon, Polyester plastics, Gas lasers, Ignition, Pyrolysis, Decomposition, Nuclear explosions.
Identifiers: *Flameproofing, *Laser heating, Tungstophosphoric acids, Molybdophosphoric acids, Carbon dioxide lasers.

A feasibility study was conducted to determine whether high-molecular-weight inorganic additives, particularly those with high oxygen content, can be used effectively as permanent flame retardants for cotton, rayon, roofing material, nylon, and polyester. Results show that cellulosic materials treated with either phosphomolybdic acid, phosphotungstic acid, or ammonium phosphotungstate do not sustain flaming ignition when exposed to an irradiance of 6.2 cal/sq cm-sec from a CO2 laser for 6.3 seconds. Furthermore, the retardant treatment caused a drastic change in the decom-

position products of the materials and increased the yields of char. More extensive evaluation of the efficiency of these treatments and of the technique is needed to substantiate the present findings. Comparison of the results of isothermal pyrolysis of cotton with those of alpha-cellulose suggests that there might be differences in the kinetics of decomposition of the two materials.

COM-72-50993 PC-GPO/MF$0.95-NTIS
National Bureau of Standards, Washington, D.C. Fire Technology Div.
UNITED STATES AND CANADIAN FABRIC FLAMMABILITY STANDARDS.
Final rept.,
Richard G. Katz. Oct 72, 57p NBS-TN-742
Paper copy available from GPO $0.60 as C13.46:742.

Descriptors: (*Fire resistant textiles, Standards), (*Fabrics, Flammability), (*Flammability, *Standards), Flammability testing, Apparel fabrics, Clothing, Children, Bedding equipment, United States, Canada.
Identifiers: Flammable Fabrics Act, Hazardous Products Act, *Children's sleepwear.

Current fabric flammability standards of the United States and Canada are described. The 1967 amendment to the Flammable Fabrics Act of 1953 gave impetus to basic and applied research in the United States and to the development of new test methods and standards for fabric products. Commercial Standard 191-53, the 45-degree angle test, applies to most clothing items, but a new stringent vertical test was developed for children's sleepwear. In 1970, Canada amended the Hazardous Products Act of 1969 to ban from sale those products already declared dangerously flammable by the United States, and ban from sale some berets and sweatshirts that did not meet the 45-degree angle test. Later amendments (1971) deleted the 1970 amendments and established a basic minimum flammability standard covering all textile products for consumer use. A more stringent standard was established for children's sleepwear and bedding (excluding mattresses, mattress pads and pillows) that uses the same 45-degree angle test but with a time of flame spread of 7 seconds or less. (Author)

N72-28543 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DEVITRIFICATION AND SHRINKAGE BEHAVIOR OF SILICA FIBERS.
I. Zaplatynsky. Jul 72, 23p NASA-TN-D-6891, E-6900

Descriptors: *Crystallization, *High temperature tests, *Shrinkage, *Silicon dioxide, Fibers, Quartz, Thermal insulation, Thermal stability, Viscous flow, X ray diffraction.

For abstract, see STAR 10 19.

N72-28568 PC$6.50/MF$0.95
Little (Arthur D.), Inc., Cambridge, Mass.
DEVELOPMENT OF A FLAMEPROOF ELASTIC ELASTOMERIC FIBER.
Final Report, 1 Jan. 1970 - 1 Jan. 1971
J. T. Howarth, J. Nilgrom, A. Massucco, S. G. Sheth, and F. Dawn. Mar 71, 87p
NASA-CR-115227, ADL-72210
Contract NAS9-10424

Descriptors: *Elastomers, *Fire prevention, *Fireproofing, *Flammability, *Urethanes, Chemical reactions, Product development, Synthesis, Synthetic fibers.

For abstract, see STAR 10 19.

N72-29529 PC$4.50/MF$0.95
Hough Lab., Springfield, Ohio.
IMPROVEMENT OF CHEMICAL VAPOR DEPOSITION PROCESS FOR PRODUCTION OF LARGE DIAMETER CARBON BASE MONOFILAMENTS.
Technical Report, Nov. 1970 - Nov. 1971
R. L. Hough, and R. D. Richmond. Nov 71, 47p
NASA-CR-120902
Contract NAS3-14325

Descriptors: *Carbon fibers, *Production engineering, *Vapor deposition, Boron, Composite materials, Modulus of elasticity, Surface defects, Tensile strength.

For abstract, see STAR 10 20.

N72-29587 PC$10.50/MF$0.95
Utah Univ., Salt Lake City. Dept. of Mechanical Engineering.
FRACTURE BEHAVIOR IN NYLON 6 FIBERS.
Ph.D. Thesis
B. A. Lloyd. Jun 72, 167p NASA-CR-127777
Contract NGL-45-003-029

Descriptors: *Electron paramagnetic resonance, *Fractures (materials), *Nylon (trademark), Chemical bonds, Deformation, Free radicals, Mathematical models, Polymer physics, Strain rate, Stress relaxation.

For abstract, see STAR 10 20.

N72-30498 PC$3.50/MF$0.95
Dynatech Corp., Cambridge, Mass.
DEVELOPMENT OF SELF EXTINGUISHING DURETTE AND/OR NOMEX FABRIC.
Final Report
20 Jun 72, 28p NASA-CR-115765, REPT-1033
Contract NAS9-12247

Descriptors: *Extinguishing, *Fabrics, Physical properties, Treatment.

For abstract, see STAR 10 21.

11F. Metallurgy and Metallography

AD-750 390 PC$3.00/MF$0.95
Frankford Arsenal Philadelphia Pa
EFFECT OF INGOT THERMAL MECHANICAL PROCESSING TREATMENTS ON THE GRAIN SIZE AND PROPERTIES OF WROUGHT 7075 ALLOY,
Jeffrey Waldman, and Harry V. Sulinski. 1972, 15p

Descriptors: (*Aluminum alloys, *Heat treatment), Mechanical working, Microstructure, Grain size, Mechanical properties.
Identifiers: *Thermomechanical treatments, Aluminum alloy 7075.

A program was initiated to investigate the effect of ingot processing parameters on the properties of wrought aluminum alloy products. The paper describes an investigation of the effect of ingot thermal mechanical processing treatments on the grain size and mechanical properties of wrought homogeneous 7075 alloy. (Author)

AD-750 410 PC$3.00/MF$0.95
California Univ Los Angeles School of Engineering and Applied Science
THE PROPERTIES OF RARE EARTH METALS AND ALLOYS.
Semi-annual technical rept. 1 Mar-31 Jul 72,
D. L. Douglas, and J. D. Kuenzly. Sep 72, 20p
Rept no. UCLA-ENG-7283
Grant DAHC15-70-G-15, APRA Order-1643

Descriptors: (*Nickel alloys, *Corrosion resistance), (*Anodic coatings, Nickel alloys), Additives, Heat-resistant metals + alloys, Oxidation, Reaction kinetics, X-ray diffraction analysis, Rare earth elements, Alumina, Yttrium, Oxides, Aluminum alloys, Scale, Spallation.
Identifiers: *Rare earth containing alloys.

The high-temperature oxidation behavior of Ni3Al (Ni-13 w/o Al) with and without additions of 0.5% yttrium has been studied over the range of 900 to 1200C in air. None of the commonly accepted rate laws were followed by the kinetics. Although the weight gains of samples containing yttrium were consistently 10 to 20% greater than those without yttrium, the steady-state scaling rates were identical. A quantitative X-ray diffraction technique was used to determine the kinetics of growth of the protective alpha-Al2O3 layer (one of several oxides formed). The alumina growth followed the parabolic rate law under all conditions studied. The presence of yttrium greatly increased the short-time scale adherence. At longer times, however, the outer layer of NiAl2O4 and unreacted NiO spalled off along with some of the inner AlO3 layer. (Author)

AD-750 411 PC$3.00/MF$0.95
Rensselaer Polytechnic Inst Troy N Y
PROCEEDINGS OF THE MEETING OF THE MECHANICAL FAILURES PREVENTION GROUP (17TH) HELD AT THE NATIONAL BUREAU OF STANDARDS, BOULDER, COLO. ON 25-27 APRIL 1972.
Technical rept.,
W. T. Sawyer. 1 Nov 72, 92p MFPG-10
Contract N00014-67-A-0117-0015
See also report dated 1 Feb 72, AD-738 855.

Descriptors: (*Failure (Mechanics), Symposia), (*Metals, Failure (Mechanics)), (*Plastics, Failure (Mechanics)), (*Glass, Failure (Mechanics)), Detection, Stress corrosion, Lubricants, Cracks, Ball bearings, Jet engines, Degradation, Damage, Wear resistance, Gas turbines, Predictions, Impurities.
Identifiers: Mechanical failure, *Wear tests, *Failure analysis.

Presented is a report of three-day discussions by a group of nationally-recognized specialists on the subject 'Environmental Effects on Mechanical Failures, Mechanisms and Detection.' Summaries are presented of fifteen prepared talks which had as their objectives the examination of the state of the art on various aspects of environmental effects on mechanical failures, the mechanisms involved, and the methods of detection. Limitations and gaps on the technology available for problem solving are identified, providing guidance for future research. Reports of problems encountered in current field service provide an estimate of the magnitude of the problem and the relevance of current research. Significant audience discussions are reported. (Author)

AD-750 495 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
DEPENDENCE OF FRICTION PROPERTIES ON THE TECHNOLOGY OF THIOCYANIDING STEEL FRICTION DISKS,
V. A. Kulikov, and A. V. Kryulin. 28 Jul 72, 13p
Rept no. FTD-MT-24-2149-71
Edited machine trans. of Tekhnologiya Sudostroeniya (USSR) n121 p106-111 1969, by Rene E. Courville.

Descriptors: (*Steel, Friction), (*Case hardening, Steel), Disks, USSR.
Identifiers: Translations.

Steels 5 and 65 G were researched. The tests were conducted under conditions of dry friction. Both models of each pair of friction disks were sulfocyanided simultaneously in a single bath, after which they were cooled in air, washed in water, and their working surface cleaned with a metal brush. Before the testing the models were scoured clean of grease with acetone. It was established that sulfocyaniding reduces the coefficient of fric-

tion of the steel and, at the same time, that the coefficient of friction depends on the depth of the hard zone of the layer, on the initial composition of the sulfocyaniding bath, and on the temperatures used. (Author)

AD-750 519 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
INVESTIGATION OF ANTIFRICTION PROPERTIES OF COPPER ALLOYED MAGNESIUM CAST IRONS,
Yu. S. Lerner, and A. A. Getman. 25 Aug 72, 14p Rept no. FTD-HC-23-1017-72
Unedited rough draft trans. of mono. Povyshenie Dolgovechnosti Litykh Materialov (Increasing the Life Expectancy of Cost Materials) n.p., 1969 p59-72.

Descriptors: (*Iron, Wear resistance), Friction, Copper alloys, Magnesium alloys, USSR.
Identifiers: *Cast iron, Translations, *Antifriction materials.

The wear resistance of copper alloyed (0.54-1.45%) magnesium cast iron is investigated. The comparative data on wear resistance during the reciprocating motion of different friction pairs show the advantages of magnesium cast iron alloyed with 1.15% copper (wear coefficient K equals 0.35), over bronze OTsS 5-5-5 (K equals 1.57) and magnesium cast iron alloyed with 0.5% P (K equals 0.93). Wear resistance testing with hardened rollers of magnesium cast iron specimens, alloyed with 1.15% Cu (K equals 0.37), produced results which were twice higher than those of bronze specimens AKh 9-4 (K equals 0.74).

AD-750 532 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
INVESTIGATION OF THE MECHANICAL PROPERTIES OF ALUMINUM ALLOYS FOR PRECISION CASTING,
I. F. Kolobnev, V. A. Vasilev, and G. F. Kuznetsov. 16 Jun 72, 9p Rept no. FTD-MT-24-2123-71
Edited machine trans. of mono. Progressivnaya Tekhnologiya Liteinogo Proizvodstva (Progressive Technology of Casting Production) Gorkii, 1969 p510-511, by Robert Allen Potts.

Descriptors: (*Aluminum alloys, Mechanical properties), (*Casting alloys, Aluminum alloys), USSR.
Identifiers: Translations.

Studies have shown that the mechanical properties of gagarin samples, cast by the lost-wax process, are increased if the molds are filled at the shop temperature. A reduction of mechanical properties is observed for aluminum alloys (when pouring aluminum alloys into heated molds) as a result of the decomposition of the solid solution and the coagulation of particles of silicon. Also, a more coarse-grained structure is seen.

AD-750 579 PC$5.00/MF$0.95
Hughes Aircraft Co Culver City Calif Electronic Properties Information Center
ELECTRICAL RESISTIVITY DATA AND BIBLIOGRAPHY ON TITANIUM AND TITANIUM ALLOYS.
Interim rept.,
John T. Milek. Mar 70, 41p* Rept no. EPIC-IR-27
Contract F33615-68-C-1225

Descriptors: (*Titanium, Resistance (Electrical)), (*Titanium alloys, Resistance (Electrical)), Cryogenics, Temperature, Bibliographies.

Contents:
Titanium alloy compositions;
Electrical resistivity vs temperature;
Electrical resistivity vs alloying and temperature;
Electrical resistivity vs cryogenic temperature;
Bibliography.

AD-750 593 PC$3.00/MF$0.95
Army Weapons Command Rock Island Ill Weapons Lab
HOT HARDNESS INVESTIGATION OF REFRACTORY METALS AND ALLOYS.
Technical rept.,
Cyrus H. Phillco, and Donald H. Sale. Sep 72, 30p Rept no. SWERR-TR-72-63

Descriptors: (*Heat-resistant metals + alloys, Hardness), (*Automatic weapons, Gun barrels), High-temperature research, Chromium, Tungsten, Tantalum alloys, Molybdenum, Niobium alloys, Tantalum, Niobium, Steel.
Identifiers: Tantalum alloy Ta-222, Tantalum alloy Ta-111, Niobium alloy 2Hf 3Mo 11W, Niobium alloy 33 Ta 1Zr, Niobium alloy 10 Ta 10W.

The investigation was conducted to determine the hardness of several refractory metals and alloys at temperatures from 70F to 2000F. Microhardness tests were made in vacuum under controlled conditions to provide comparable screening data for predicting the strengths of these materials in high-temperature applications such as gun barrel liners. Materials tested included tungsten, molybdenum, columbium, tantalum, columbium-base alloys, and tantalum-base alloys. Chromium plate and Cr-Mo-V steel, currently used in gun barrels, were also tested for comparison. (Author)

AD-750 646 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
INVESTIGATION OF THE HEAT RESISTANCE OF ST-4 TITANIUM ALLOY AND CERTAIN PROTECTIVE COATINGS ON IT,
Z. I. Kornilova, D. V. Ignatov, and E. M. Lazarev. 25 Aug 72, 11p Rept no. FTD-HT-23-1118-72
Edited trans. of Fizika i Khimiya Obrabotki Materialov (USSR) n3 p113-115 1971, by Paul J. Reiff, Jr.

Descriptors: (*Titanium alloys, Corrosion resistance), (*Silicon coatings, Titanium alloys), Corrosion inhibition, Silicides, Titanium compounds, Molybdenum compounds, Heat-resistant metals + alloys, USSR.
Identifiers: Protective coatings, Translations.

A kinetic and structural investigation was carried out of the oxidizability in the temperature interval of 700-1000 C of the ST-4 titanium alloy, unprotected and protected by coatings based on Si and Mo-Si. The Si coating consisted mainly of the compound Ti5Si3 and TiSi and TiSi2 traces; the Mo-Si coating consisted mainly of MoSi2 and of Mo5Si3. (Author)

AD-750 655 PC$3.00/MF$0.95
Office of Naval Research London (England)
INTERNATIONAL CONGRESS ON HYDROGEN IN METALS, PARIS, FRANCE, 29 MAY - JUNE 1972.
Conference rept.,
George Sandoz. 28 Sep 72, 19p Rept no. ONRL-C-15-72

Descriptors: (*Hydrogen embrittlement, *Symposia), Metals, Reviews, Diffusion, Welding, France.

The report reviews the International Congress on Hydrogen in Metals held in Paris, France during the period 29 May - 2 June 1972. A copy of the program and list of attendees is provided. (Author)

AD-750 716 PC$3.00/MF$0.95
Philco-Ford Corp Newport Beach Calif Aeronutronic Div
THE EFFECTS OF PRIOR DEFORMATION AND TRANSFORMATIONS ON THE MICROSTRUCTURE OF AN IRON-NICKEL ALLOY.
Technical rept.,
Kanji Ono, and Theodore J. Koppenaal. Oct 72, 36p Rept no. TR-3
Contract N00014-70-C-0223

Descriptors: (*Iron alloys, Microstructure), Nickel alloys, Phase studies, Heat treatment, Deformation, Hardening, Electron microscopy.
Identifiers: *Thermomechanical treatment, Work hardening, Transmission electron microscopy.

The microstructure of an Fe-31.4% Ni-0.03% C alloy was examined via transmission electron microscopy as a function of thermomechanical treatment. The effects of prior deformation, rapid reversion to austenite and thermal cycling on the microstructure were investigated and operative strengthening mechanisms in specimens under various conditions were clarified. (Author)

AD-750 746 PC$3.00/MF$0.95
Dayton Univ Ohio Research Inst
RESEARCH AND DEVELOPMENT OF RARE EARTH-TRANSITION METAL ALLOYS AS PERMANENT-MAGNET MATERIALS.
Semiannual interim technical rept. 1 Jan-30 Jun 72, Alden E. Ray, and Karl J. Strnat. Aug 72, 81p Rept no. UDRI-TR-72-41 AFML-TR-72-202
Contract F33615-70-C-1625

Descriptors: (*Magnetic alloys, Rare earth elements), (*Magnets, Manufacturing methods), Intermetallic compounds, Phase studies, Iron alloys, Cobalt alloys, Magnetic properties, Thermal properties, Anisotropy.
Identifiers: *Permanent magnets.

The results of thermomagnetic analyses of the R2 (Co (1-x)Fe (x))17 phases with R = Ce, Pr, Sm, Y, and MM above room temperature are reported, as well as the results of room temperature saturation magnetization for the phases with R = Ce, Pr, Nd, Sm, and Y. The magnitude of the magnetocrystalline anisotropy has been measured on a large number of magnetically aligned powder specimens for the ternary phases with R = Ce, Pr, Sm, Y, and MM. The phase Ce2 (Co (0.5)Fe (0.5))17 has been re-examined by metallographic, x-ray diffraction, and electron microprobe analyses to explain the unusual thermal and magnetic transitions observed by DTA and TMA for the iron-rich Ce2 (co (1-x)Fe (x))17 phases with $0.4 < or = x < or = 0.7$. The neodymium-cobalt alloy system has been re-examined and a revised phase diagram is proposed. The results of some preliminary sintering experiments using NdCo5 and DiCo5 as base metals and 60 Sm/40 Co and 70 Pr/30 Co alloys as sintering aids are reported. (Author)

AD-750 851 PC$3.00/MF$0.95
Naval Intelligence Support Center Washington D C Translation Services Div
CORROSION RESISTANCE OF STAINLESS STEELS IN SEA WATER AT HIGHER TEMPERATURES (KORROZIONNAYA STOIKOST NERZHAVEYUSHCHIKH STALEI V MORSKOM VODE PRI POVYSHENNYKI TEMPERATURAKH),
G. A. Allakhverdiev, V. G. Yusifov, S. M. Efendi-Zade, and A. F. Agalarova. 28 Sep 72, 5p Rept no. NISC-Trans-3340
Trans. of Azerbaidzhanskoe Neftyanoe Khozyaistvo (USSR) n8 p47-48 1970.

Descriptors: (*Stainless steel, *Corrosion), Sea water, Chlorides, Molybdenum alloys, Pipes, USSR.
Identifiers: *Sea water corrosion, Translations.

Various steels were tested for their corrosion resistance to sea water.

AD-750 896 MF$0.95
Naval Intelligence Support Center Washington D C Translation Services Div
FIZIKO-KHIMICHESKAYA MEKHANIKA MATERIALOV, NUMBER 7, 1971. (SELECTED

TRANSLATIONS). SOVIET MATERIALS SCIENCE.
28 Sep 72, 20p Rept no. NISC-Trans-3343
Trans. of Fiziko-Khimicheskaya Mekhanika Materialov, n7 p10-15, 18-21, 87-91 1971.
Availability: Available in microfiche only.

Descriptors: (*Steel, *Barrier coatings), (*Pipes, Corrosion resistance), (*Stress corrosion, Crack propagation), (*Aluminum, Anodic coatings), (*Titanium alloys, Fatigue (Mechanics)), Aluminum coatings, Nickel, Hardening, Failure (Mechanics), Stresses, Sheets, USSR.
Identifiers: *Drill Pipe, *Electromechanical hardening, Thermomechanical treatment, Translations.

Contents:
- Effect of the barrier layer on certain properties of aluminized medium carbon steel;
- Effect of electromechanical hardening on resistance of drill pipes to corrosion fatigue failure;
- Corrosion-crack trajectory in biaxial plane state of stress;
- Effect of anodizing on fatigue limit and corrosion-fatigue strength of duraluminum sheets with stress concentrators;
- Effect of structure on fatigue strength of certain titanium alloys.

AD-750 932 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
STUDY OF THE CORROSION RESISTANCE OF VARIOUS METALS TO THE ACTION OF DICHLOROETHANE,
A. Popov, M. I. Goryaev, and M. G. Pugachev. 18 Aug 72, 9p Rept no. FTD-HT-23-320-72
Edited trans. of Akademiya Nauk Kazakhskoi SSR, Alma Ata. Institut Khinicheskikh Nauk. Trudy, v27 p52-53 1970, by Bernard L. Tauber.

Descriptors: (*Halogenated hydrocarbons, *Hydrolysis), (*Corrosion, *Organic solvents), Hydrochloric acid, Chlorine compounds, pH, Lead, Steel, Copper, Aluminum, Stainless steel, USSR.
Identifiers: *Ethane/dichloro, Translations.

Tests on the study of corrosion resistance of metals to the action of dichloroethane showed that the loss in the weight of metals in an atmosphere of this solvent is insignificant and the dichloroethane molecule is comparatively stable. There is no need to fear heavy corrosion of equipment in using dichloroethane as a solvent in the process of the hydrolysis of vegetal resources by concentrated sulfuric acid. (Author)

AD-750 948 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
SOLDER FOR CONNECTING SEMICONDUCTOR SYSTEMS WITH A METAL BASE,
Ivan Soska. 17 Aug 72, 7p Rept no. FTD-HT-23-0285-72
Edited trans. of Patent (Czechoslovakia) 134 400 2p 1969, by Henry Peck.

Descriptors: (*Soldering alloys, Patents), (*Semiconductor devices, Manufacturing methods), Lead, Gold, Indium, Czechoslovakia.
Identifiers: Translations.

The report concerns solder for connecting semiconductor systems with a metal base having a different thermal expansibility. It is distinguished by the fact that it is composed of 45-90% lead, 1-10% gold and the rest indium. (Author)

AD-750 964 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
SPECIAL FEATURES OF THE FAILURE OF ALPHA-TITANIUM ALLOYS AT HIGH TEMPERATURES,
S. S. Ushkov, and L. S. Moroz. 25 Aug 72, 13p
Rept no. FTD-HT-23-489-72
Edited trans. of Optimizatsiya Metallurgicheskikh Protsessov (USSR) n4 p397-402 1970, by Paul J. Reiff, Jr.

Descriptors: (*Titanium alloys, Failure (Mechanics)), Microstructure, Plasticity, Grain boundaries, USSR.
Identifiers: Translations.

The plasticity of Ti alpha-alloys in fine- and coarse-grained states was studied at high temperatures. The anomalous decrease in plasticity was observed from 500 degrees to the transformation temperature. The failure of Ti alloys at high temperatures has an intergranular character. The failure mechanism at high temperatures consists in accumulation of pores, which causes microfractures. The pores are formed on the grain boundaries at any type of stresses in the samples where compressive stresses are absent. Small pores can be healed by annealing. The formation of pores at grain boundaries occurs both during prolonged application of stress and during deformation at rates approaching static loading. (Author)

AD-751 011 Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
EFFECTS OF COMBINED HIGH AND LOW TEMPERATURE DEFORMATION PROCESSING OF BETAIII TITANIUM,
James A. Roberson, and Attwell M. Adair. 20 Aug 71, 10p Rept no. ARL-72-0139
Availability: Pub. in Metallurgical Transactions, v3 p1967-1972 Jul 72.

Descriptors: (*Titanium alloys, *Mechanical working), Heat treatment, Molybdenum alloys, Zirconium alloys, Tin alloys, Microstructure, Mechanical properties, Deformation.
Identifiers: Thermomechanical processing, Titanium alloy 11.5Mo 4.5Sn 6Zr.

The structure and properties of betaIII titanium alloy (nominal composition: 11.5 pct Mo, 6 pct Zr, 4.5 pct Sn, bal Ti) were studied as a function of combined high and low temperature thermomechanical processing. A water quenched extrusion was deformed various amounts of swaging at room temperature prior to the aging treatment. No re-solution heat treatment was employed. The swaging introduced mechanical twinning and a small amount of stress induced orthorhombic martensite. Following a 900F, 8 hr aging treatment, substantial increases in yield and tensile strength were observed, combined with a severe decrease in tensile ductility in samples with small amounts of swaging. The orientation and morphology of the deformation products have a critical influence on tensile ductility. A decrease in the plane strain fracture toughness accompanied the large increase in tensile strength. (Author)

N72-28132 PC$3.00/MF$0.95
Metaalinstituut TNO, Delft (Netherlands).
EXAMINATION OF CORRODED RUDDER HUB DOKKUM CLASS . ONDERZOEK GESCHEURDE ROERKONING DOKKUM--KLASSE.
T. P. Regenboog. 8 Feb 72, 13p
M72/07/18-REG/HT

Descriptors: *Corrosion, *Microstructure, *Rudders, *Surface properties, Adhesives, Forging, Heat treatment, Metal working, Protective coatings, Structural analysis.

For abstract, see STAR 10 19.

N72-28537 PC$4.25/MF$0.95
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
THERMAL CONDUCTIVITY, ELECTRICAL RESISTIVITY, AND THERMOPOWER OF AEROSPACE ALLOYS FROM 4 TO 300 K. 6 FE--22CR-13NI-5MN STAINLESS STEEL.
J. G. Hust, and L. L. Sparks. 28 Jul 71, 41p
NASA-CR-127683, NBS-9799
Contract NASA ORDER W-13300, NBS PROJ. 27503-2750430

Descriptors: *Furnaces, *Stainless steels, *Test equipment, *Thermodynamic properties, Data acquisition, Electrical resistivity, Thermal conductivity.

For abstract, see STAR 10 19.

N72-28540 PC$5.75/MF$0.95
Technische Hogeschool, Delft (Netherlands).
THE GOLD NICKEL PLATINUM SYSTEM . HET SYSTEEM AU-NI-PT.
Ph.D. Thesis
S. M. Carmio. 7 Jun 72, 75p

Descriptors: *Gold alloys, *Isothermal processes, *Nickel alloys, *Phase diagrams, *Platinum alloys, Solid solutions, Ternary systems, Thermochemistry, Thermodynamic properties.

For abstract, see STAR 10 19.

N72-28541 PC$9.00/MF$0.95
Technische Hogeschool, Delft (Netherlands).
THE PORTEVIN-LE CHATELIER EFFECT IN GOLD COPPER ALLOYS . HET PORTEVIN-LE CHATELIER EFFECT IN GOUD-KOPER LEGERINGEN.
Ph.D. Thesis
A. Wijler. 30 May 72, 136p

Descriptors: *Copper alloys, *Crystal dislocations, *Gold alloys, *Interstitials, *Tensile deformation, Band structure of solids, Electron transitions, Lattice vibrations, Tensile stress.

For abstract, see STAR 10 19.

N72-28546 PC$3.00/MF$0.95
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
CORROSION STUDY OF BARE AND COATED STAINLESS STEEL.
J. D. Morrison. Jul 72, 64p NASA-TN-D-6519

Descriptors: *Environmental tests, *Fluid transmission lines, *Stainless steels, *Stress corrosion, Chlorides, Ground support equipment, Protective coatings.

For abstract, see STAR 10 19.

N72-28547 PC$3.00/MF$0.95
Aeronautical Research Labs., Melbourne (Australia).
THE ALUMINUM-RICH CORNER OF THE AL--MG-AG PHASE DIAGRAM.
B. E. Williams. Apr 72, 15p ARL/MET-NOTE-80

Descriptors: *Aluminum alloys, *Magnesium alloys, *Phase diagrams, *Silver alloys, *X ray diffraction, Isothermal processes, Materials tests, Ternary alloys.

For abstract, see STAR 10 19.

N72-28704 PC$3.50/MF$0.95
Aeronautical Research Labs., Melbourne (Australia).
RADIAL STREAKS IN ELECTRON DIFFRACTION PATTERNS OBSERVATION AND THEORY.
P. A. Doyle, M. R. Kindermann, and J. F. Nankivell. Sep 71, 26p ARL/MET-NOTE-77

Descriptors: *Aluminum, *Chromium, *Diffraction patterns, *Electron diffraction, Aberration, Cold rolling, Debye-scherer method.

For abstract, see STAR 10 19.

N72-28766 PC$3.00/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
PRELIMINARY RESULTS REGARDING DEVELOPMENT OF SUPERCONDUCTING RIBBONS OF NB3SN.
G. Pasotti, M. V. Ricci, N. Sacchetti, G. Sacerdoti, and M. Spandoni. Jul 72, 14p NASA-TT-F-14327, LNF-70/18
Contract NASW-2038
Tran- Transl. Into English of Cnen, Frascati, Italy, Rept. Lnf-70/18, 5 May 1970

Descriptors: *Niobium compounds, *Superconductivity, *Tin compounds, Chemical reactions, Magnetic fields, Ribbons.

For abstract, see STAR 10 19.

N72-29561 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HIGH-TEMPERATURE STRENGTH OF REFRACTORY-METAL WIRES AND CONSIDERATION FOR COMPOSITE APPLICATIONS.
D. W. Petrasek. Aug 72, 40p NASA-TN-D-6881, E-6795

Descriptors: *High temperature, *Refractory metal alloys, *Rupturing, *Tensile strength, Metallography, Microstructure, Tensile tests, Tungsten alloys, Wire.

For abstract, see STAR 10 20.

N72-29891 PC$12.00/MF$0.95
Battelle Memorial Inst., Columbus, Ohio.
DETERMINATION OF DESIGN ALLOWABLE STRENGTH PROPERTIES OF ELEVATED-TEMPERATURE ALLOYS. PART 1 COATED COLUMBIUM ALLOYS.
R. J. Favor, D. J. Maykuth, E. S. Bartlett, and H. Mindlin. 31 Mar 72, 197p NASA-CR-123745
Contract NAS8-26325

Descriptors: *Materials tests, *Niobium, *Spacecraft construction materials, Mechanical properties, Physical properties, Temperature effects.

For abstract, see STAR 10 20.

N72-30427 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
INFLUENCE OF ALLOYING ELEMENTS ON FRICTION AND WEAR OF COPPER.
D. H. Buckley. Sep 72, 14p NASA-TN-D-6912, E-6949

Descriptors: *Air, *Copper alloys, *Friction, *Wear, Binary alloys, Surface reactions.

For abstract, see STAR 10 21.

N72-30457 PC$7.25/MF$0.95
Western Applied Research and Development, Inc., San Carlos, Calif.
MATERIALS DATA HANDBOOK ALUMINUM ALLOY 5456.
R. F. Muraca, and J. S. Whittick. Jun 72, 102p NASA-CR-123770
Contract NAS8-26644

Descriptors: *Aluminum alloys, *Handbooks, *Physical properties, Bonding, Fabrication, Mechanical properties, Procurement.

For abstract, see STAR 10 21.

N72-30458 PC$7.75/MF$0.95
Western Applied Research and Development, Inc., San Carlos, Calif.
MATERIALS DATA HANDBOOK ALUMINUM ALLOY 6061.
R. F. Muraca, and J. S. Whittick. May 72, 114p NASA-CR-123772
Contract NAS8-26644
Misc 0revised

Descriptors: *Aluminum alloys, *Handbooks, *Physical properties, Bonding, Fabrication, Mechanical properties, Procurement.

For abstract, see STAR 10 21.

N72-30459 PC$9.25/MF$0.95
Western Applied Research and Development, Inc., San Carlos, Calif.
MATERIALS DATA HANDBOOK ALUMINUM ALLOY 7075.
R. F. Muraca, and J. S. Whittick. Apr 72, 141p NASA-CR-123773
Contract NAS8-26644
Misc 0revised

Descriptors: *Aluminum alloys, *Handbooks, *Physical properties, Bonding, Fabrication, Mechanical properties, Procurement.

For abstract, see STAR 10 21.

N72-30460 PC$7.75/MF$0.95
Western Applied Research and Development, Inc., San Carlos, Calif.
MATERIALS DATA HANDBOOK INCONEL ALLOY 718.
R. F. Muraca, and J. S. Whittick. Apr 72, 115p NASA-CR-123774
Contract NAS8-26644

Descriptors: *Handbooks, *Inconel (trademark), *Mechanical properties, Bonding, Corrosion, Fabrication, Physical properties.

For abstract, see STAR 10 21.

N72-30461 PC$9.50/MF$0.95
Western Applied Research and Development, Inc., San Carlos, Calif.
MATERIALS DATA HANDBOOK ALUMINUM ALLOY 2219.
R. F. Muraca, and J. S. Whittick. Mar 72, 149p NASA-CR-123777
Contract NAS8-26644

Descriptors: *Aluminum alloys, *Handbooks, *Mechanical properties, Bonding, Corrosion, Fabrication, Physical properties.

For abstract, see STAR 10 21.

N72-30462 PC$7.50/MF$0.95
Western Applied Research and Development, Inc., San Carlos, Calif.
MATERIALS DATA HANDBOOK STAINLESS STEEL TYPE 301.
R. F. Muraca, and J. S. Whittick. Apr 72, 106p NASA-CR-123780
Contract NAS8-26644

Descriptors: *Handbooks, *Mechanical properties, *Stainless steels, Bonding, Corrosion, Fabrication, Physical properties.

For abstract, see STAR 10 21.

N72-30463 PC$7.50/MF$0.95
Western Applied Research and Development, Inc., San Carlos, Calif.
MATERIALS DATA HANDBOOK STAINLESS STEEL ALLOY A-286.
R. F. Muraca, and J. S. Whittick. Jun 72, 109p NASA-CR-123776
Contract NAS8-26644

Descriptors: *Handbooks, *Mechanical properties, *Stainless steels, Bonding, Corrosion, Fabrication, Physical properties.

For abstract, see STAR 10 21.

N72-30464 PC$8.25/MF$0.95
Western Applied Research and Development, Inc., San Carlos, Calif.
MATERIALS DATA HANDBOOK. TITANIUM 6AL-4V.
R. F. Muraca, and J. S. Whittick. May 72, 124p NASA-CR-123775
Contract NAS8-26644

Descriptors: *Handbooks, *Mechanical properties, *Titanium alloys, Bonding, Corrosion, Fabrication, Physical properties.

For abstract, see STAR 10 21.

N72-30465 PC$3.50/MF$0.95
Montana Coll. of Mineral Science and Technology, Butte.
A METALLOGRAPHIC EVALUATION OF SOME COATED COLUMBIUM ALLOYS.
V. Griffiths. Jan 72, 28p NASA-CR-127917
Contract NGR-27-003-001

Descriptors: *Lacquers, *Metal coatings, *Niobium, *Substrates, Metallography, Space shuttles, Spacecraft structures.

For abstract, see STAR 10 21.

N72-30468 PC-GPO/MF$0.95-NTIS
Battelle Memorial Inst., Columbus, Ohio.
THE ALLOY WITH A MEMORY, 55-NITINOL ITS PHYSICAL METALLURGY, PROPERTIES, AND APPLICATIONS.
Technology Utilization
C. M. Jackson, H. J. Wagner, and R. J. Wasilewski. 1972, 91p NASA-SP-5110, LC-74-177266
Subm- Sponsored By Nasa. Paper copy available from GPO $1.00.

Descriptors: *Chemical properties, *Mechanical properties, *Metallurgy, *Nitinol alloys, *Physical properties, Industries, Metal working, Nasa programs, Structural stability, Technology utilization, Thermal stability.

For abstract, see STAR 10 21.

N72-30469 PC$3.00/MF$0.95
Hayes International Corp., Huntsville, Ala.
BANDING DUE TO TEMPERATURE OSCILLATIONS IN THE UNIDIRECTIONAL SOLIDIFICATION OF EUTECTIC ALLOYS.
A. Kidron. 1 Aug 72, 13p NASA-CR-61391, WD-551

Descriptors: *Aluminum alloys, *Bands, *Copper alloys, *Eutectics, *Solidification, *Temperature effects, Crystal growth, Interlayers, Phase transformations.

For abstract, see STAR 10 21.

N72-30470 PC$3.00/MF$0.95
Aerojet Solid Propulsion Co., Sacramento, Calif. Advanced Technology.
CORRELATION OF STRESS-WAVE-EMISSION CHARACTERISTICS WITH FRACTURE ALUMINUM ALLOYS.
Final Report
C. E. Hartbower, W. G. Reuter, C. F. Morais, and P. P. Crimmins. Jul 72, 233p NASA-CR-2072
Contract NAS8-21405

Descriptors: *Acoustic measurements, *Aluminum alloys, *Cracking (fracturing), *Fatigue tests, Stress waves, Structural failure, Wave propagation, Welding.

For abstract, see STAR 10 21.

N72-30474 PC$4.00/MF$0.95
Battelle Memorial Inst., Columbus, Ohio.
INVESTIGATION OF THE REACTION OF 5AL-2.5SN TITANIUM WITH HYDROGEN AT SUB-ZERO TEMPERATURE.
Final Report, 24 Jun. 1971 - 15 Apr. 1972
D. N. Williams, and R. A. Wood. 15 May 72, 36p
NASA-CR-128496
Contract NAS9-12044

Descriptors: *Hydrogen, *Low temperature tests, *Surface reactions, *Temperature effects, *Titanium alloys, Aluminum alloys, Hydrides, Metallography, Tensile properties, Tin alloys.

For abstract, see STAR 10 21.

N72-30478 PC$11.50/MF$0.95
National Aerospace Lab., Amsterdam (Netherlands).
A REVIEW AND ANALYSIS OF FATIGUE CRACK PROPAGATION IN TITANIUM ALLOYS AT ROOM TEMPERATURE.
R. J. Wanhill. Feb 71, 186p NLR-TR-71035-U
Subm- Sponsored By Neth. Aircraft Develop. Board

Descriptors: *Crack propagation, *Metal fatigue, *Stress corrosion, *Titanium alloys, Cyclic loads, Room temperature, Salt spray tests, Tables (data).

For abstract, see STAR 10 21.

N72-30502 PC$4.00/MF$0.95
Engelhard Minerals and Chemicals Corp., Newark, N.J. Research and Development Dept.
DEVELOPMENT OF PLATINUM-THORIUM OXIDE ALLOY FOR RESISTOJET THRUSTER USE.
Final Report
H. J. Albert, and J. S. Hill. Jul 71, 37p
NASA-CR-111959
Contract NAS1-10433

Descriptors: *Electrical properties, *Mechanical properties, *Platinum alloys, *Resistojet engines, *Thorium oxides, Rupturing, Stress ratio, Temperature effects, Tensile tests.

For abstract, see STAR 10 21.

TT-70-59080 PC$3.00/MF$0.95
National Bureau of Standards, Washington, D.C. Diffusion in Metals Data Center.
DIFFUSION IN STEEL ALLOYS AND THE THEORY OF THE STRUCTURE OF METALS BASED ON THE EXPERIENCES OF PROFESSOR M. K. TSIGLER (DIFFUSION NPIMESIE V STAL I TSELLYVLYARNAYA (KLETOCHNAYA) TEORIE STROENIYA METALLOV PO RABOTAM PRO F. M. K. TSIGLERA),
N. Ageev, and M. Zamotorin. 1970, 29p DMDC-5777
Trans. of Politekhnicheskii Institut, Leningrad. Izvestiya (USSR) v31 p183-196 1928. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Alloy steels, *Thermal diffusion), Metallurgical analysis, Grain structure, Microstructure, Admixtures, Phase transformations, Translations, USSR.

A review of early Soviet research on diffusion in iron and steels. The effect of various alloying additions (e.g. Manganese, Silicon, Sulfur, Phosphorous) and pressure on the diffusion process was studied and results are presented in a qualitative manner. (Author)

TT-70-59123 PC$3.00/MF$0.95
National Bureau of Standards, Washington, D.C. Diffusion in Metals Data Center.
ON IONIC STATE OF AUSTENITE (OB IONNOM SOSTOYANII AUSTENITA),
T. A. Lebedev. 1970, 11p DMDC-5902
Trans. of Metallurg, Leningrad (USSR) n15 p61-63 1940. Sponsored in part by National Science Foundation. Special Foreign Currency Science Information Program.

Descriptors: (*Iron alloys, *Thermal diffusion), Austenite, Metallurgical analysis, Phase transformations, Austenitizing, Carbon steels, USSR, Translations.
Identifiers: Carbon migration, Electrotransport.

The electrotransport of carbon in iron (containing 0.35 to 0.40 w% carbon) subjected to a D.C. current was studied. Temperature of specimens reached 1000C. The carbon migrated to the cathode. Carbon also was found to migrate to the hot portions of the samples. Applied magnetic fields had no effect on carbon migration. (Author)

11G. Miscellaneous Materials

AD-750 569 PC$3.00/MF$0.95
Army Coating and Chemical Lab Aberdeen Proving Ground Md
EVALUATION OF A FREEZING POINT TEST KIT FOR ANTIFREEZE.
Final rept.,
Charles B. Jordan. Sep 72, 15p Rept no. CCL-314

Descriptors: (*Freezing point depressants, Test equipment), Acceptability.
Identifiers: Evaluation, *Antifreezes.

The objects of the study was to evaluate a test kit for the determination of the freezing point of antifreeze solutions in the field. The kit consists of a plastic strip 3-1/4 inch by 1/4 inch with a dry reagent pad 1/4-inch square attached to one end. The reagent pad is chemically impregnated so that it changes color when dipped into various concentrations of ethylene glycol. The kit was tested in the laboratory with various antifreeze solutions. It was also tested on the antifreeze in approximately 90 military vehicles. (Author)

11H. Oils, Lubricants, and Hydraulic Fluids

AD-750 485 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
A VARIATIONAL METHOD FOR SOLVING THE ISTHERMAL PROBLEM OF THE HYDRODYNAMIC THEORY OF LUBRICATION FOR A THRUST BEARING HAVING AN UNDEFORMED PAD,
P. Z. Popov. 7 Sep 72, 19p Rept no. FTD-HC-23-0878-72
Unedited rough draft trans. from Korablestroitelnyi Institut, Leningrad. Trudy (USSR) n67 p149-159 1969.

Descriptors: (*Lubrication, *Thrust bearings), Hydrodynamics, Lubricants, Friction, USSR.
Identifiers: Translations.

The article deals with the problem of the hydrodynamic theory of lubrication of the pad of a thrust bearing with a rectangular supporting surface. Integration of the Reynolds equation was performed in an approximate manner by the Kantorovich variational method. The solution of the problem was determined in the second approximation. Characteristic curves were constructed for the parameters which determine the carrying capacity, the force of friction, the point of approach of the resultant forces of pressure, the consumption and temperature rise of the lubricant. An example of calculation of the thrust bearing is given.

AD-750 507 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
HIGHLY ALKALINE DETERGENT ADDITIVE BASED ON NAPHTHENIC ACIDS,
A. M. Kuliev, K. I. Sadykhov, F. G. Suleimanova, R. A. Ibragimov, and N. F. Tuzhikova. 8 Sep 72, 9p Rept no. FTD-HT-23-442-72
Edited trans. of Prisadki k Smzochnym Maslam (USSR) n2 p12-14 1969, by Rene E. Courville.

Descriptors: (*Lubricant additives, Cleaning compounds), Salts, Cycloalkanes, pH, Magnesium compounds, Calcium compounds, Spark ignition engines, Corrosion inhibition, Test methods, USSR.
Identifiers: *Naphthenates, Detergents, Motor vehicles engines, Scale (Corrosion), Translations.

Various organic compounds including napthenates of metals, are used to improve the detergent properties of motor oils. There are methods of preparing metal napthenates by treating napthenic acids with different inorganic salts. The authors synthesized a highly alkaline detergent additive made up of magnesium and calcium salts of napthenic acids.

AD-750 518 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
EFFECT OF OIL QUALITY ON RELIABILITY AND LONGEVITY OF ZIL-164 ENGINE,
M. I. Borisov, O. I. Manusadzhyants, O. S. Obleukhova, and V. V. Protasov. 25 Aug 72, 13p Rept no. FTD-HC-23-1003-72
Unedited rough draft trans. from Nauchno-Issledovatelskii Institut Avtomobilnogo Transporta. Ekspluatatsionno-Tekhnicheskie Svoistva i Primenenie Avtomobilnykh Topliv, Smazochnykh Materialov i Spetszhidkostei (USSR) p123-133 1970.

Descriptors: (*Lubricant additives, Effectiveness), (*Spark ignition engines, *Lubrication), Internal combustion engines, Engine cylinders, Piston rings, Wear resistance, Viscosity, Additives, USSR.
Identifiers: Translations, ZIL-164 engines.

The performance characteristics of two different motor oils, one with additives and one without, on the reliability and longevity of the ZIL-164 engine are investigated by means of a special two-year test program. The oil with additives was found to be superior to oil without additives. (Author)

AD-750 526 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
TESTS OF THE COMPOSITIONS AND FEED METHODS OF LUBRICANT-COOLING FLUIDS DURING SCREW CUTTING WITH TAPS,
A. V. Denisenko, S. I. Murashkin, and M. Ya. Slobodnik. 8 Sep 72, 6p Rept no. FTD-HT-23-861-72
Edited trans. of Politekhnicheskii Institut, Gorkii. Trudy (USSR) v26 n6 p14-15 1970, by Paul J. Reiff, Jr.

Descriptors: (*Taps, Quenching (Cooling)), (*Screw threads, Cutting), Cutting fluids, Machine shop practice, Cutting tools, Lathes, Aerosols, Liquid cooled, Quality control, USSR.
Identifiers: Translations.

The results of tests showed that one can recommend 1.5% pulverized emulsion of E-2 emulsifier as a lubricating cooling liquid for a screw cutting operation in iron and steel on a multipurpose stand. It is most favorable to produce a thread by screw taps in iron and steel at V=10.2 m/min. It is recommended that pulverization of the emulsion be produced with the aid of the UR-3A device with a design by the Scientific Research Laboratory of Machine Tools and Tools. The expenditure of lubricating cooling liquid is 400 to 600 g/hr and the pressure of the atomized air is 1 kg/square centimeter. (Author)

AD-750 640 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
SYNERGISTIC EFFECT OF SUCCINIMIDE AND BISPHENOL ADDITIVES,
A. B. Vipper, and V. A. Tarasov. 7 Aug 72, 10p Rept no. FTD-HT-23-1023-72
Edited trans. of Neftepererabotka i Neftekhimiya (USSR) n3 p25-27 1971, by Marilyn Olaechea.

Descriptors: (*Lubricant additives, *Succinimides), (*Phenols, Lubricant additives), Spectra (Infrared), Antioxidants, USSR.
Identifiers: *Bisphenols, Phenol/4-4'-isopropylidene-di, Synergism, Translations.

The study of combinations of succinimides and bisphenols is interesting in view of the effectiveness of mixtures of these additives in motor oils and in view of the insufficient amount of research done on the effect of each of the components when used together. The authors studied a mixture of oil DS-11 with the indicated additives obtaining differential spectra of IR composition absorptions. It was found that the compounds have a synergistic effect on each other.

AD-750 643 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
EFFECT OF FREE ALKALIES AND ACIDS ON THE PROPERTIES OF COMPLEX CALCIUM GREASES,
M. B. Nakonechnaya, N. S. Goshko, Yu. L. Ishchuk, and V. V. Sinitsyn. 28 Jul 72, 12p Rept no. FTD-HT-23-1235-72
Edited trans. of Neftepererabotka i Neftekhimiya (USSR) n4 p109-113 1971, by Rene Courville.

Descriptors: (*Greases, Physical properties), (*Soaps, Physical properties), Potassium compounds, Calcium compounds, Rheology, Fatty acids, Concentration (Chemistry), USSR, Salts.
Identifiers: *Metallic soaps, Translations.

Free alkalies and acids substantially affect the rheological properties of K,Ca greases prepared both on the basis of stearic acids and on a fraction of SFA C (10)-C (20). An alkali excess, which exceeds the stoichiometric, when introduced into the grease, back-titrates incompletely. When preparing K,Ca greases it is necessary to carefully do this per the quantity of Ca (OH)2 introducible into the grease. The best results were obtained with the introduction into the grease of Ca (OH)2 in an amount close to the stoichiometric in regard to increasing the thickening ability of the K,Ca soap.

AD-750 752 PC$3.00/MF$0.95
Mechanical Technology Inc Latham N Y
RESEARCH ON ELASTOHYDRODYNAMIC LUBRICATION OF HIGH SPEED ROLLING-SLIDING CONTACTS.
Final rept. 1 Feb 71-1 Feb 72,
Richard L. Smith, Jed A. Walowit, Pradeep K. Gupta, and John M. McGrew. Jul 72, 157p Rept no. MTI-71TR41 AFAPL-TR-72-56
Contract F33615-69-C-1305

Descriptors: (*Lubrication, Hydrodynamics), Films, Oils, Measurement, Lubricants.
Identifiers: Traction.

A rolling disc apparatus was used to obtain traction measurements for a MIL-L-7808 oil. A full matrix of data covering a range of loads, speeds, and temperatures are presented along with analytical correlation which reasonably describes the data over these parameters. Attempts were made to measure film thickness with optical, capacitance, and X-ray measuring techniques. The partial elastohydrodynamic regime was studied analytically and experimentally. Electrical continuity and resistance data have been obtained and comparisons between measured electrical resistance and predictions obtained with the asperity interactions analysis put forth in Task 2 were obtained. (Author)

AD-750 929 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
USE OF SOZH DURING THE MACHINING OF MAGNETIC ALLOYS,
L. V. Komolaeva, Yu. I. Nikitin, B. V. Pogorelyi, G. F. Skripko, and S. M. Sohkin. 15 Sep 72, 10p Rept no. FTD-HT-23-758-72
Edited trans. of Sinteticheskie Almazy Nauchno-Proizvodstvennyi Sbornik (USSR) v2 n5 p6-9 1970, by Rene E. Courville.

Descriptors: (*Diamond wheels, *Cutting fluids), (*Magnetic alloys, *Machining), Antiseize compounds, Machinability, Grinders, Lubricants, Wear resistance, Machine shop practice, USSR.
Identifiers: Translations, Solid lubricants.

The film forming lubricant coolant ISM and, especially the film forming and chloride containing lubricant TPP-2 were very efficient for diamond machining of magnetic alloys (YuNDK 24). The contact angles for lubricant TPP-2, ISM, 6% emulsifying oil emulsion, and 1.5% Na2CO3 solution were 12, 42, 58, and 63 degrees, respectively. (Author)

AD-750 930 PC$3.25/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
RESULTS OF RESEARCH IN THE FIELD OF ALKYLPHENOL ADDITIVES,
G. A. Zeinalova. 31 Aug 72, 25p Rept no. FTD-HT-23-595-72
Edited trans. of mono. K Voprosu Proizvodstva Masel i Prisadok v Azerbaidzhane (On the Problems of Producing Oils and Additives in Azerbaidzhan) Baku, 1970 p24-52, by Ray E. Zarza.

Descriptors: (*Lubricant additives, *Phenols), Condensation reactions, Calcium compounds, Barium compounds, Salts, Organic sulfur compounds, Organic phosphorus compounds, Amines, Formaldehyde, Wear resistance, Antioxidants, Corrosion inhibition, USSR.
Identifiers: Organic sulfides, *Phosphorodithioates, Translations.

The preparation of Ba and Ca salts of alkylphenols and bis (2-hydroxyphenylalkyl) sulfides are discussed along with the condensation products of alkylphenols with HCHO or HCHO and urea, an amine or NH3 as well as the dithiophosphates of the latter. The properties and performance of lubricating oils containing these antiwear, antioxidant, anticorrosion, and detergent additives are reviewed.

AD-750 934 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE MEANING OF TRIBOCHEMICAL REACTIONS BETWEEN ADDITIVES AND METALS DURING FRICTION AND WEAR PROCESSES,
Helga Dunken. 14 Aug 72, 25p Rept no. FTD-HC-23-1134-72
Unedited rough draft trans. of Zeitschrift fuer Chemie (East Germany) v11 n6 p213-219 1971.

Descriptors: (*Lubrication, Chemical reactions), (*Friction, Chemical reactions), Additives, Metals, Wear resistance, Surfaces, Corrosion, East Germany.
Identifiers: *Tribology, Surface chemistry, Translations.

The article concerns the meaning of tribochemical reactions between additives and metals during friction and wear process.

AD-750 967 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE SYNTHESIS OF PHOSPHORUS- AND SULPHUR-CONTAINING COMPOUNDS AND A STUDY OF THEIR ACTION ON THE QUALITY OF LUBRICATING OILS,
R5 K. Mamedova, and S. M. Abutalybova. 1 Sep 72, 20p Rept no. FTD-HC-23-1126-72
Edited trans. of mono. K Voprosu Proizvodstva Masel i Prisadok v Azherbaidzhane (Questions of Oil-Additive Production), n.p., 1970 p78-98.

Descriptors: (*Lubricant additives, Organic phosphorus compounds), (*Organic phosphorus compounds, Synthesis (Chemistry)), Sulfur compounds, Phosphates, Corrosion inhibition, Cleaning compounds, Zinc compounds, Calcium compounds, Sulfides, Alkenes, USSR.
Identifiers: *Phosphorodithioates, Detergents, Cracking process, Translations.

Compounds containing both S and P, giving good anticorrosion and detergency properties to lubricating oils and having good compatibility with other additives, were prepared by treating dialkyl dithiophosphates ((RO)2P (S)SH) with unsaturated compounds, e.g. MeCN, Me methacrylate, or vinyl acetate to give trialkyl dithiophosphates. They were also prepared by polymerizing paraffin or kerosene thermal cracking products, the residue from petroleum cracking, low molecular weight polymers, or isobutylene, treating the polymers with P2S5, and converting the products to their Ca, Ba, or Zn salts. A third method was by converting mixtures of dithiophosphate and dithiophosphonate diesters prepared from P2S5 and octyl alcohol, alkylphenols, and (or) polymer distillates to their An or Ba salts. (Author)

AD-750 986 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
SILICA GEL PLASTIC GREASES RESISTANT TO CORROSIVE MEDIA,
E. D. Makeeva, T. K. Ostrovskaya, O. V. Ataeva, B. S. Gurenkov, and Z. P. Slugina. 31 Aug 72, 15p Rept no. FTD-HT-23-871-72
Edited trans. of Plastichnye Smazki i Tverdye Smazochnye Pokrytiya (USSR) n11 p158-164 1969, by Ray E. Zarza.

Descriptors: (*Greases, Physical properties), Silicon dioxide, Mixtures, Halogenated hydrocarbons, Corrosive liquids, Compatibility, Lubricant additives, Gels, Moisture, USSR.
Identifiers: *Acid resistance, Dispersants, Thickeners (Materials), Translations, Chemical resistance.

Two greases were synthesized. The dispersion medium for the first grease are polymers of trifluorochloroethylene which boil when the range of 140-200C at 10 torr, and for the second grease – no. 30 synthetic oil. Used as thickeners for these greases were special synthesized organosilica gels - alkylsilyl derivative, and in alkyl alcoxysilyl derivative of silicic acid gel. Treated with the thickeners, these two greases were found to be exceedingly moisture resistant; they can withstand boiling in water for 100 hr without the separation of the dispersion medium from the thickener; they also possess high chemical and colloidal stability and do not cause corrosion of metal, and do not melt. (Author)

AD-750 987 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
DETERMINATION OF THE ZINC CONTENT IN HYDROCARBON LUBRICANTS,
A. G. Gulyaeva, T. G. Ilchenko, V. A. Kuznetsov, and V. V. Simashko. 25 Aug 72, 11p Rept no. FTD-HT-23-494-72
Edited trans. of Neftepererabotka i Neftekhimiya (USSR) n4 p20-22 1971, by Ray E. Zarza.

Descriptors: (*Lubricants, Chemical analysis), (*Cables (Mechanical), Lubricants), (*Zinc, Chemical analysis), Corrosion, Chemical analysis, Volumetric analysis, Polarographic analysis, Corrosion, USSR.

Identifiers: Galvanized materials, Dithizone analysis, Translations.

The protective properties of lubricating materials for galvanized cables can be evaluated according to the amount of build-up of the corrosive products (ions of the metal) in the lubricants over a determined period of time. In the reported work, dry ashing and extraction were used for the transfer of zinc from the lubricant to the aqueous solution. In the aqueous solution zinc was determined by complexometric titration, extraction titration with a solution of dithizone in carbon tetrachloride, and polarographically.

AD-758 998 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
ASSORTMENT OF SOLID LUBRICATION COATINGS USING A MOLYBDENUM DISULFIDE BASE AND THE FIELD OF THEIR APPLICATION,
L. Sentyurikhina, E. Oparina, Z. Rubtsova, and V. Listov. 1 Sep 72, 18p Rept no. FTD-HC-23-0866-72 Edited trans. of Vsesoyuznii Nauchno-Issledovatelskii Institut Neftepererabatyvayushchei Promyshlennosti. Trudy (USSR) n11 p252-262 1969.

Descriptors: (*Lubricants, *Molybdenum compounds), Mixtures, Sulfides, Wear resistance, Urea, Silicates, Epoxy plastics, Lubricant additives, Test methods, USSR.
Identifiers: *Molybdenum disulfide, *Solid lubricants, Translations.

The properties of 5 solid lubricating coatings based on molybdenum disulfide were determined on friction testing machines. These lubricants were tested by using gear wheels, gear type couplings, gear racks, screws and nuts, click devices, ball joints, pivot bearings, and rope drums.

N72-28505 PC$3.75/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPARATIVE LUBRICATION STUDIES OF OH-58A TAIL ROTOR DRIVE SHAFT BEARINGS.
M. W. Dietrich, R. J. Parker, and E. V. Zaretsky. Jul 72, 34p NASA-TM-X-68118, E-7054

Descriptors: *Ball bearings, *Lubricant tests, *Military helicopters, *Rotary wings, Environmental tests, Life (durability), Shafts (machine elements), Shrouds.

For abstract, see STAR 10 19.

N72-28511 PC$5.00/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Charles Stark Draper Lab.
OIL-FILM-PARAMETER INVESTIGATION.
E. P. Kingsbury. Apr 72, 58p NASA-CR-115746, E-2650
Contracts NAS9-4065, DSR PROJ. 55-23829

Descriptors: *Elastohydrodynamics, *Film thickness, *Lubricating oils, Fluid films, Interfacial tension, Measurement.

For abstract, see STAR 10 19.

N72-29491 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FRICTION AND WEAR LIFE PROPERTIES OF POLYIMIDE THIN FILMS.
R. L. Fusaro. Aug 72, 15p NASA-TN-D-6914, E-6960

Descriptors: *Coefficient of friction, *Polyimides, *Thin films, *Wear tests, Argon, Atmospheric composition, Moisture, Solid lubricants, Temperature effects.

For abstract, see STAR 10 20.

N72-29533 PC$12.50/MF$0.95
Mobil Research and Development Corp., Paulsboro, N.J. Research Dept.
MICROFOG LUBRICANT APPLICATION SYSTEM FOR ADVANCED TURBINE ENGINE COMPONENTS, PHASE 2. TASKS 3, 4 AND 5 WETTABILITY AND HEAT TRANSFER OF MICROFOG JETS IMPINGING ON A HEATED ROTATING DISC, AND EVALUATION OF RECLASSIFYING NOZZLES AND A VORTEX MIST GENERATOR.
J. Shim, and S. J. Leonardi. 1 Jun 72, 207p
NASA-CR-120843
Contract NAS3-13207

Descriptors: *Heat transfer, *Lubrication, *Thermodynamic properties, *Turbine engines, High temperature environments, Inert atmosphere, Nitrogen.

For abstract, see STAR 10 20.

N72-30428 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
BOUNDARY LUBRICATION OF FORMULATED C-ETHER IN AIR TO 300 DEG C. 1 PHOSPHORUS ESTER ADDITIVES.
W. R. Jones, Jr., and W. F. Hady. Sep 72, 19p
NASA-TN-D-6915, E-6682

Descriptors: *Friction measurement, *Lubrication, *Polyphenyls, *Wear tests, Friction reduction, Loads (forces), Sliding friction.

For abstract, see STAR 10 21.

N72-30429 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECT OF POLARITY OF ELECTRIC CURRENT ON FRICTION BEHAVIOR OF TWO GALLIUM-LUBRICATED TANTALUM SLIPRING ASSEMBLIES.
J. Przybyszewski. Sep 72, 27p NASA-TN-D-6969, E-6974

Descriptors: *Electric equipment, *Electrical properties, *Ring structures, *Tantalum, Equipment specifications, Gallium, Lubrication, Vacuum apparatus.

For abstract, see STAR 10 21.

N72-30430 PC$12.50/MF$0.95
Mobil Research and Development Corp., Paulsboro, N.J.
MICROFOG LUBRICANT APPLICATION SYSTEM FOR ADVANCED TURBINE ENGINE COMPONENTS, PHASE 2. TASKS 3, 4, 5 WETTABILITY AND HEAT TRANSFER OF MICROFOG JETS IMPINGING ON A HEATED ROTATING DISC, AND EVALUATION OF RECLASSIFYING NOZZLES AND A VORTEX MIST GENERATOR.
J. Shim, and S. J. Leonardi. 31 Aug 71, 207p
NASA-CR-120843
Contract NAS3-13207

Descriptors: *Heat transfer, *High temperature lubricants, *Turbine engines, *Wettability, Lubricant tests, Lubricating oils, Mass flow.

For abstract, see STAR 10 21.

11I. Plastics

AD-750 380 PC$3.00/MF$0.95
Army Natick Labs Mass
HIGH-TEMPERATURE POLYAMIDES FROM NEW HEXAHYDROBENZODIPYRROLE MONOMERS,
John T. Stapler, and Joseph Bornstein. 1972, 14p*

Descriptors: (*Heat-resistant plastics, Synthesis (Chemistry)), (*Polyamide plastics, Synthesis (Chemistry)), Physical properties, Imides, Solubility, Thermogravimetric analysis, Differential thermal analysis, Thermal stability, N-heterocyclic compounds.
Identifiers: *Poly ((benzodipyrrolediyl/hexahydro)-carbonyl-phenylene-carbonyl).

The Army has a high priority program to provide protective clothing to air and tank crewmen who are subject to possible exposure to intense heat and flame as a result of accident or enemy action. The paper reports on the synthesis of a new class of heterocyclic polyamides made possible by the successful synthesis and isolation of two new hexahydrobenzodipyrrole monomers. These newly prepared monomers reacted readily with diacid chlorides to form polyamides. A number of such polymers has been achieved with a selected group of diacid chlorides and a limited characterization by standard techniques provides data indicating that outstanding thermal properties are possible.

AD-750 396 PC$3.00/MF$0.95
Battelle Columbus Labs Ohio
THERMAL DEGRADATION OF HIGH TEMPERATURE POLYMERS AND COMPOSITES.
Final rept. 24 Jun 71-29 May 72,
W. H. Pfeifer, and C. A. Gaulin. 23 Jun 72, 96p
Contract N60921-71-C-0250

Descriptors: (*Heat-resistant plastics, *Decomposition), Ablation, Thermogravimetric analysis, Differential thermal analysis, Mass spectrum, Degradation, Thermal stability.
Identifiers: *Polyquinoxalines.

A study was performed to examine the thermal degradation process and char forming characteristics of a number of polyquinoxaline polymers. The techniques used were primarily of thermogravimetry, differential thermal analysis, and mass spectrometry. Constant heating rate and isothermal degradation experiments were carried out in vacuum, and to some extent, in air; the isothermal degradation rates were used to obtain an approximate activation energy for the degradation process. The quinoxaline-based polymers showed improved thermal stability and greater carbon yields compared to conventional polymers. Thermal degradation occurred in three discrete steps. Generalized degradation mechanisms that have been derived for these polymers from combined mass spectrometry and residue analysis results are described. (Author)

AD-750 731 PC$3.00/MF$0.95
Rutgers - the State Univ New Brunswick N J Bureau of Engineering Research
EFFECT OF HIGH PRESSURE ON PROPERTIES OF POLYMERS.
Final rept. 15 Nov 68-1 Jul 72,
J. A. Sauer, and K. D. Pae. Oct 72, 6p AROD-7928:6-C
Grant DA-ARO (D)-31-124-G1078

Descriptors: (*Polymers, High-pressure research), (*Hydrostatic pressure, Polymers), Mechanical properties, Plastics, Degradation.

The report briefly summarizes the results of the research studies carried out during the last three and a half years concerning the effects of hydrostatic pressure on the mechanical behavior and mechanical properties of polymers. This research is summarized by briefly stating the problems studies and the general results obtained, and then listing the papers published, the progress reports submitted, the technical papers presented at conferences, the theses completed or partially completed, and the faculty directly or indirectly involved. (Author)

AD-750 926 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio

AN INVESTIGATION OF FILLED AND PLASTICIZED POLYVINYL CHLORIDE,
Yu. G. Tarasenko, M. V. Venediktov, V. P. Dyshchenko, and B. S. Kolupaev. 25 Aug 72, 16p Rept no. FTD-HT-23-465-72
Edited trans. of Vysokomolekulyarnye Soedineniya. Seriya A (USSR) n13 p1539-1545 1971, by Ray E. Zarza.

Descriptors: (*Polyvinyl chloride, Additives), (*Plasticizers, Polyvinyl chloride), Composite materials, Viscoelasticity, Phthalates, Salts, Clay minerals, Lead compounds, Bismuth compounds, Mercury compounds, Stability, Mechanical properties, USSR.
Identifiers: *Filled thermoplastics, Fillers, Particulate composites, Polymer additives, Kaolin, Translations.

The report discusses the viscoelastic properties, heat, and heat resistance of polyvinyl chloride (PVC) plasticized with dibutylphthalate (DBF) and filled kaolin modified with salts of the heavy metals: lead, bismuth and mercury. It was established that kaolin with adsorbed lead, bismuth and mercury ions on its surface, is an active stabilizing filler of PVC. It was also shown that small amounts of DBP increase, and larger amounts--reduce the dynamic modulus of elasticity, E. The introduction of a plasticizer in PVC, filled with an inert filler, results in a sharper reduction in the physico-mechanical characteristics. The plasticization of PVC containing active fillers, is accompanied at first by small changes in the glass transition temperature and a large increase in E.

N72-28133 PC$3.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
THE STABILITY OF ESTER TYPE PLASTICIZERS. 2 THE INFLUENCE OF INORGANIC FILLERS AND PIGMENTS ON THE VOLATILITY OF PHTHALIC ACID PLASTICIZERS.
Z. Wolkober. Feb 72, 20p NASA-TT-F-14404
Tran- Transl. Into English From Mag. Kem. Lapja (Budapest), V. 23, No. 8, 1968 P 433-439

Descriptors: *Additives, *Phthalates, *Plasticizers, *Volatility, Inorganic compounds, Oxidation resistance, Pigments, Thermodynamic properties.

For abstract, see STAR 10 19.

N72-30501 PC$3.75/MF$0.95
Battelle Memorial Inst., Columbus, Ohio.
DEVELOPMENT OF NONFLAMMABLE CELLULOSIC FOAMS.
Final Report
M. Luttinger. 27 Jul 72, 31p NASA-CR-128512
Contract NAS9-12412

Descriptors: *Cellulose, *Foams, *Protection, *Skylab program, Esters, Halogenation, Inorganic compounds, Nonflammable materials.

For abstract, see STAR 10 21.

11J. Rubbers

AD-750 562 PC$3.00/MF$0.95
Explosives Research and Development Establishment Waltham Abbey (England)
HIGH PERFORMANCE POLYURETHANE ELASTOMERS. PART 1. LABORATORY AGEING TRIALS.
Technical rept.,
B. E. Brokenbrow, D. Sims, and J. Wright. Jan 72, 68p Rept no. ERDE-TR-77 DRIC-BR-29466
See also Part 2, AD-750 563.

Descriptors: (*Isocyanate plastics, Aging (Materials)), (*Elastomers, Isocyanate plastics), Polyester plastics, Alcohols, Butadienes, Environmental tests, Ultraviolet radiation, Liquid immersion tests, Mechanical properties, Polymerization, Additives, Water, Oils, Great Britain.
Identifiers: Hydroxy terminated polybutadiene, Polybutadiene, Flexibility, Lactams, Polymer additives, Solvent resistance.

A range of polyurethane elastomers based on diisocyanate prepolymers of polyether, hydroxyl-terminated polybutadiene, polyester adipate and caprolactone polyols have been prepared and their ageing properties assessed under a wide variety of laboratory simulated environmental conditions, including exposure to dry air (80 - 100C), ultraviolet radiation; immersion in oil at 100C, STF (65C) and water (50 - 100C). (Author)

AD-750 563 PC$3.00/MF$0.95
Explosives Research and Development Establishment Waltham Abbey (England)
HIGH PERFORMANCE POLYURETHANE ELASTOMERS. PART 2. MILLABLE ELASTOMERS AND SYNTACTIC FOAMS.
Technical rept.,
B. E. Brokenbrow, D. Sims, and J. Wright. Jan 72, 25p Rept no. ERDE-TR-83 DRIC-BR-29104
See also Part 1, AD-750 562.

Descriptors: (*Isocyanate plastics, Liquid immersion tests), (*Elastomers, Isocyanate plastics), Mechanical properties, Polyester plastics, Alcohols, Butadienes, Water, Oils, Curing agents, Composite materials, Great Britain.
Identifiers: Hydroxy terminated polybutadiene, Polybutadiene, *Solvent resistance, Filled elastomers.

Polyurethane elastomers based on millable sulphur cured polycaprolactone, polyoxy 1,4-butylene glycol and hydroxyl terminated polybutadiene/diisocyanate precursors, chain extended with unsaturated diols, together with liquid cast polyoxy 1,4-butylene glycol di-isocyanate prepolymers filled with small hallow spheres (syntactic foams) were assessed to determine their resistance to water (80C) and Standard Test Fluid (65C). Two commercially supplied urethane elastomers, one based on a low molecular weight polyether/toluene di-isocyanate prepolymer cured with methylene-bis- (2-chloroaniline), the other on a higher molecular weight polyether/4,4'-methylene bis-cyclohexyl di-isocyanate prepolymer, cured with methylene bis-aniline were also assessed for comparison. (Author)

AD-750 592 PC$3.00/MF$0.95
Army Weapons Command Rock Island Ill Weapons Lab
OIL-RESISTANT ELASTOMERS WITH LOW PERMEABILITY TO NITROGEN.
Technical rept.,
John A. Williams. Aug 72, 20p Rept no. SWERR-TR-72-58

Descriptors: (*Elastomers, Permeability), Compatibility, Organic solvents, Additives, Composite materials, Mica, Carbon black, Mechanical properties, Silicone plastics, Nitrile rubber.
Identifiers: *Polymer gas permeability, Solvent resistance, *Filled elastomers, Fillers, Flexibility, Epichlorohydrin polymers, Polymeric films.

The purpose of the work was to reduce the nitrogen gas transmission rate (GTR) and permeability coefficient of oil-resistant elastomers without adversely affecting other physical properties. This was accomplished through the use of various fillers of proper size and shape to produce a blocking effect, thus reducing gas transmission through the polymer film. Carbon black and most nonblack fillers produced only a small reduction in GTR, whereas platelike mica and graphite fillers produced significant reductions of as much as 78 per cent. These reductions in GTR were achieved without serious loss of oil resistance or compression set; but, in some cases, loss in flexibility at low temperatures was noted. (Author)

AD-751 617 PC$3.00/MF$0.95
Naval Ordnance Lab White Oak Md
VISCOELASTIC PROPERTIES OF 1,2 POLYBUTADIENE AND COMPARISON WITH OTHER RUBBERS,
W. M. Madigosky, and Jim VonBretzel. 23 Aug 72, 24p Rept no. NOLTR-72-192

Descriptors: (*Elastomers, *Viscoelasticity), Temperature, Ultrasonic radiation, Acoustic properties, Velocity, Test methods, Transition temperature, Attenuation.
Identifiers: *Polybutadiene, Acoustic velocity, Ultrasonic tests, Glass transition temperature.

The dynamic viscoelastic properties of polybutadiene rubber consisting of principally 1,2 microstructure are of interest to the Navy. These properties have been determined by measuring the velocity and attenuation coefficient of ultrasonic waves in the material from 300 kHz to 5 MHz and from -50C to 100C. The sound velocity was found to increase with decreasing temperature, leveling off both at high and low temperatures. This effect is attributed to the appearance of a crystalline shear elasticity at the lower temperatures. Peaks in the attenuation as a function of both temperature and frequency were observed. It was also found that the data could be represented by reduced frequency or temperature plots by assuming that the dynamic properties undergo a transition which is exponentially proportional to the fractional free volume (Williams-Landel-Ferry formularization).

N72-28574 PC$12.75/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EXPERIMENTAL INVESTIGATION OF THE MECHANICAL BEHAVIOR OF A FILLED ELASTOMER AT PRESSURES BELOW 10 TO THE -6TH POWER TORR.
Ph.D. Thesis - Va. Polytechnic Inst.
G. L. Gregory. May 72, 214p NASA-TM-X-68688

Descriptors: *Elastomers, *Mechanical properties, *Vacuum effects, Fracture mechanics, Outgassing, Relaxation (mechanics), Spacecraft environments, Stresses.

For abstract, see STAR 10 19.

N72-30506 PC$3.50/MF$0.95
Explosives Research and Development Establishment, Waltham Abbey (England).
LOW TEMPERATURE FLEXIBILITY OF ELASTOMERS.
B. E. Brokenbrow, D. Sims, and A. L. Stokoe. Aug 70, 26p ERDE-TR-40, BR23439

Descriptors: *Dynamic modulus of elasticity, *Low temperature tests, *Rubber, *Tensile tests, Glass, Plastics, Temperature effects, Tensile properties, Torsion, Transition temperature.

For abstract, see STAR 10 21.

N72-30507 PC$4.00/MF$0.95
Explosives Research and Development Establishment, Waltham Abbey (England).
RELATIONSHIPS BETWEEN POLYURETHANE ELASTOMER STRUCTURE AND AGEING PROPERTIES. PART 4 EFFECT OF DI-ISOCYANATE.
B. E. Brokenbrow, D. Sims, and J. Wright. Jun 71, 38p ERDE-TR-68-PT-4, BR28516

Descriptors: *Diisocyanates, *Elastomers, Aging (materials), Crosslinking, Curing, Diamines, Mechanical properties, Polyester resins, Polyether resins.

For abstract, see STAR 10 21.

N72-30508 PC$3.50/MF$0.95
Explosives Research and Development Establishment, Waltham Abbey (England).

RELATIONSHIPS BETWEEN POLYURETHANE ELASTOMER STRUCTURE AND AGEING PROPERTIES. PART 2 EFFECT OF BACKBONE POLYOL.
B. E. Brokenbrow, D. Sims, and J. Wright. Jun 71, 27p ERDE-TR-53

Descriptors: *Aging (metallurgy), *Polyester resins, *Polyether resins, *Polyurethane resins, Crosslinking, Elastomers, Glycols, Mechanical properties, Physical properties.

For abstract, see STAR 10 21.

N72-30509 PC$3.50/MF$0.95
Explosives Research and Development Establishment, Waltham Abbey (England).
RELATIONSHIPS BETWEEN POLYURETHANE ELASTOMER STRUCTURE AND AGEING PROPERTIES PART 3 EFFECTIVE CROSS-LINK STRUCTURE.
B. E. Brokenbrow, D. Sims, and J. Wright. Jun 71, 28p ERDE-TR-54

Descriptors: *Aging (metallurgy), *Crosslinking, *Elastomers, *Polyester resins, *Polyurethane resins, Curing, Mechanical properties, Physical properties, Polyether resins.

For abstract, see STAR 10 21.

11K. Solvents, Cleaners, and Abrasives

N72-30126 PC$3.00/MF$0.95
Union Carbide Corp., Oak Ridge, Tenn.
FLUORINE GAS AS A CLEANING AGENT FOR APOLLO BULK-SAMPLE CONTAINERS.
R. H. Liddle, J. M. Mcintyre, and C. E. Mcalister.
8 Mar 72, 22p NASA-CR-127821, Y-1809
Contract W-7405-ENG-26
Subm- Sponsored in Part By Nasa

Descriptors: *Bags, *Chemical cleaning, *Fluorination, Apollo applications program, Chemical sterilization, Hardware, Samplers.

For abstract, see STAR 10 21.

11L. Wood and Paper Products

PB-212 632 PC$6.00/MF$0.95
Miner (Thomas H.) and Associates, Inc., Chicago, Ill.
INDUSTRIAL DEVELOPMENT AND FEASIBILITY STUDY. PULP AND PAPER MANUFACTURING IN SOUTH VIETNAM. BOOK I.
Apr 70, 382p TA/OST-AN-70-4-1
Contract AID/VN-54
See also Book 2, PB-212 633.

Descriptors: (*Pulp mills, South Vietnam), (*Paper industry, *South Vietnam), Feasibility, Developing countries, Market research, Expenses.

Vietnam has a variety of fiber resources which in total constitute an adequate raw material for a pulp and paper industry. The present paper industry was built with only the domestic market in mind, and currently it is entirely dependent on import of pulp. Under these circumstances of small size and imported raw material, the paper industry in Vietnam suffers from high costs. This study examines the feasibility of developing a viable pulp and paper industry in Vietnam in the early post-war period. The scope of the study includes: A review of the existing industry, including facilities, capacities, capabilities, and cost factors; a survey of present and possible future markets, both domestic and in neighboring Southeast Asian countries; a survey of indigenous fibrous raw materials, including types, amounts available, location, and cost; a proposal of location, number, type, and capacity of new facilities; and a calculation of grade costs, net realization, and financial soundness of the proposed facilities.

PB-212 633 PC$6.00/MF$0.95
Miner (Thomas H.) and Associates, Inc., Chicago, Ill.
INDUSTRIAL DEVELOPMENT AND FEASIBILITY STUDY. PULP AND PAPER MANUFACTURING IN SOUTH VIETNAM. BOOK II.
Apr 70, 310p TA/OST-AN-70-4-2
Contract AID/VN-54
See also Book 1, PB-212 632.

Descriptors: (*Pulp mills, South Vietnam), (*Paper industry, *South Vietnam), Feasibility, Developing countries, Market research, Expenses.

The volume is comprised of appendices intended to accompany Book I of this study. The topics covered include: Marketing prospects for export; raw materials for a proposed kraft mill near Dalat; methods, equipment, and estimated costs for bamboo extraction at Phuoc Binh; summary of U. S. Forest Products Laboratory tests; materials, supplies, and unit costs; summary of corporate taxation and examptions; core making plant; bamboo harvesting report; bagasse report; 250 ton integrated kraft mill.

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-750 349 PC$3.00/MF$0.95
Military Academy West Point N Y
AN EXTENDED FINITE DIFFERENCES METHOD FOR THE SOLUTION OF SYSTEM PROBLEMS,
Clarence R. Longcor. 1972, 15p

Descriptors: (*Differential equations, Integration), Difference equations, Calculus of variations, Integral transforms, Matrix algebra, Partial differential equations.
Identifiers: Finite difference theory, Lagrangian functions, Numerical integration.

The material presented here is intended to extend the two hundred year old direct variational method of finite differences (DVMFD) as a numerical integration method for solving differential system equations. A numerical predictor and subsequent idealized numerical integrator are formulated. An existing counterpart to the DVMFD, the action functional, also emerges to provide a direct link between the DVMFD and the principle of Lagrange. A parallel objective then becomes one of exploring the physical identity of the action functional by way of providing an even more generalized Lagrangian recipe for handling a broad class of physical systems. (Author)

AD-750 436 Reprint
Northwestern Univ Evanston Ill Dept of Electrical Engineering
UPPER BOUNDS ON THE ORDER OF A CLIQUE OF A GRAPH,
S. L. Hakimi, and A. T. Amin. 3 Nov 71, 7p
AFOSR-TR-72-1979
Grant AF-AFOSR-2103-71
Revision of report dated 2 Feb 71.
Availability: Pub. in SIAM Jnl. of Applied Mathematics, v22 n4 p569-573 Jun 72.

Descriptors: (*Graphics, Theorems), Matrix algebra, Inequalities, Polynomials.
Identifiers: *Graph theory, Eigenvalues.

The note presents an upper bound on the order of a largest complete subgraph (a clique) of a graph. Other upper bounds are given and the relationship between this bound and an existing bound is discussed. (Author)

AD-750 456 Reprint
Texas Univ Austin Dept of Mathematics
SATURATION OF POSITIVE OPERATORS,
G. G. Lorentz, and L. L. Schumaker. 20 Oct 71, 13p AFOSR-TR-72-2023
Grants AF-AFOSR-1826-69, AF-AFOSR-1812-69
Availability: Pub. in Jnl. of Approximation Theory, v5 n4 p413-424 Jun 72.

Descriptors: (*Approximation (Mathematics), Operators (Mathematics)), Interpolation, Matrix algebra, Convex sets, Theorems.
Identifiers: Convex functions, Approximation theory.

Elementary results on generalized convexity are used to obtain saturation theorems for sequences of positive linear operators (L sup n) mapping C (a,b) into itself. (Author)

AD-750 471 PC$3.00/MF$0.95
Belfer Graduate School of Science New York
MONOTONOCITY OF QUADRATURE APPROXIMATIONS,
Donald J. Newman. 28 Sep 72, 10p AFOSR-TR-72-1994
Grant AF-AFOSR-2380-72

Descriptors: (*Approximation (Mathematics), Functions), Interpolation, Polynomials, Integration, Integrals, Convergence, Theorems.
Identifiers: Newton-Cotes quadrature, Monotone functions.

For the general quadrature rules of Newton-Cotes the author shows that the convergence is monotone for the appropriate class of functions. Included are the well known Trapezoidal and Simpson rules. (Author)

AD-750 473 PC$3.00/MF$0.95
Belfer Graduate School of Science New York Dept of Mathematics
UNBOUNDED OPERATORS IN PARTIAL DIFFERENTIAL EQUATIONS AND INTEGRAL EQUATIONS WITH APPLICATIONS TO THE LINEAR SEARCH PROBLEM.
Final rept.,
Donald J. Newman. 1972, 4p AFOSR-TR-72-2001
Grant AF-AFOSR-1736-69

Descriptors: (*Functional analysis, Reports), (*Approximation (Mathematics), Theory), Polynomials, Exponential functions, Theorems, Partial differential equations, Integral equations, Operators (Mathematics).
Identifiers: *Approximation theory.

The report discusses fourteen research publications which are principally in fields of mathematical analysis and approximation theory.

AD-750 490 PC$3.00/MF$0.95
Brown Univ Providence R I Div of Applied Mathematics
CONTROL OF DYNAMICAL SYSTEMS.
Progress rept. no. 1, 1 Apr 71-31 Aug 72,
J. P. LaSalle. 20 Sep 72, 37p AFOSR-TR-72-1995
Grant AF-AFOSR-2078-71

Descriptors: (*Adaptive control systems, Mathematical models), Partial differential equations, Stochastic processes, Monte Carlo method, Functional analysis, Feedback, Optimization, Linear systems, Numerical analysis, Integration.
Identifiers: *Control theory, Automatic control, Stochastic control, Time varying systems, Computerized simulation, Maximum principle.

The report covers the work which has been done on applications of modern control theory to the design of actual systems. Procedures have been developed that permit control system designers familiar with frequency domain techniques to understand and apply modern forms of control compensation and to indicate how the more modern

theory can be used to improve system performance. Specific applications that have been looked at are the design of large scale power plants and aircraft control. Closely related to applications is also the work done on the development of numerical methods for synthesis and numerical solutions of the partial differentials that arise in stochastic control, monte carlo optimization, a computer program for parameter adaptive control when there is a time lag, digital compensation, iterative methods improving performance and for small noise stochastic control. New results have been obtained that should provide new methods for achieving guaranteed cost control and/or asymptotic stability where there are unknown time-varying parameters. (Author)

AD-750 585 PC$3.00/MF$0.95
Minnesota Univ Minneapolis School of Mathematics
METHODS OF PARTIAL DIFFERENTIAL EQUATIONS IN AEROSPACE SCIENCE.
Final scientific rept. 16 Jun 67-15 Jun 72,
James B. Serrin. 15 Jun 72, 49p AFOSR-TR-72-1358
Grant AF-AFOSR-883-67

Descriptors: (*Functional analysis, Reports), (*Partial differential equations, Integration), Differential geometry, Complex variables, Navier-Stokes equations, Approximation (Mathematics), Reviews.
Identifiers: Approximation theory, Control theory, Applications of mathematics, Minimal surfaces.

The report discusses work in the fields of partial differential equations, ordinary differential equations, control theory, differential geometry, complex analysis, functional analysis, approximation theory, and applied mathematics.

AD-750 543 PC$3.00/MF$0.95
Johns Hopkins Univ Baltimore Md Dept of Statistics
ON THE OPTIMALITY CRITERION IN COMPOUND DECISION PROBLEMS.
Technical rept.,
Susan D. Horn. Apr 72, 29p Rept nos. TR-165, Pub-480 AFOSR-TR-72-1970
Contract F44620-70-C-0066

Descriptors: (*Statistical analysis, *Decision theory), Probability, Measure theory, Random variables, Mapping (Transformations), Theorems.
Identifiers: *Statistical decision theory, Probability measures, Bayesian decision theory.

The paper discusses the philosophy underlying the optimality criterion for compound decision problems and shows that the classical criterion is the best possible under a very broad range of circumstances. In particular, this implies that it is not necessary to resort to controversial Bayes arguments to justify existing compound decision procedures. (Author)

AD-750 547 PC$3.00/MF$0.95
Colorado Univ Boulder Dept of Mathematics
SOME BOUNDARY VALUE PROBLEMS FOR GENERALIZED DIFFERENTIAL EQUATIONS,
J. W. Bebernes, and W. Kelley. 1972, 19p AFOSR-TR-72-1996
Grant AF-AFOSR-2379-72

Descriptors: (*Boundary value problems, Theorems), Differential equations, Convex sets, Mapping (Transformations), Inequalities.
Identifiers: Two point boundary value problems.

Two versions of the Wazewski retract method are proven for generalized differential equations. These theorems are then applied to study some two-point boundary value problems for second-order generalized differential equations of the type x double primed epsilon G (t,x,x primed) where G (t,x,x primed) is an upper semi-continuous, compact, convex set-valued mapping. (Author)

AD-750 548 PC$3.00/MF$0.95
Colorado Univ Boulder Dept of Mathematics
AN EXISTENCE THEOREM FOR PERIODIC BOUNDARY VALUE PROBLEMS FOR SYSTEMS OF SECOND ORDER DIFFERENTIAL EQUATIONS,
J. Bebernes, and K. Schmitt. 1972, 10p AFOSR-TR-72-1997
Grants AF-AFOSR-2379-72, DA-ARO-D-31-124-72-G56

Descriptors: (*Boundary value problems, Theorems), Differential equations, Convex sets, Topology, Functional analysis.
Identifiers: Existence theorems.

The paper unifies the results on periodic solutions given by previous authors.

AD-750 549 PC$3.00/MF$0.95
Colorado Univ Boulder Dept of Mathematics
DIFFERENCE EQUATIONS ASSOCIATED WITH BOUNDARY VALUE PROBLEMS FOR SECOND ORDER NONLINEAR ORDINARY DIFFERENTIAL EQUATIONS,
Robert Gaines. 10 Oct 72, 41p AFOSR-TR-72-1998
Grant AF-AFOSR-2379-72

Descriptors: (*Boundary value problems, *Difference equations), (*Nonlinear differential equations, Theorems), Approximation (Mathematics), Mapping (Transformations), Interpolation, Algorithms, Green's function.
Identifiers: Existence theorems, Fixed point theorems, Ordinary differential equations.

The continuous problem and its variations have been the subject of extensive study resulting in several existence theories which are nonconstructive but which are very general and apply to problems having multiple solutions. In the paper the author studies the discrete problem and its relationship to the continuous problem and obtains versions of these existence theories which are as explicitly constructive as possible but which also retain much of the generality. The line of attack is to first obtain a priori bounds independent of h on solutions to the discrete problem and their first differences, and then use these bounds in conjunction with the Brouwer fixed point theorem to obtain existence of solutions to the discrete problem. (Author)

AD-750 675 PC$3.00/MF$0.95
Stanford Univ Calif Operations Research House
MANIFESTATIONS OF THE SCHUR COMPLEMENT.
Technical rept.,
Richard W. Cottle. Sep 72, 40p Rept no. TR-72-19
Contract N00014-67-A-0112-0011

Descriptors: (*Matrix algebra, Theory), Determinants, Mathematical programming, Statistical analysis, Algorithms.
Identifiers: Schur complement, Quadratic forms.

The report describes the ways in which a matrix theoretic construct called the Schur complement arises. Properties of the Schur complement are shown to have use in computing inertias of matrices, covariance matrices of conditional distributions, and other information of interest. (Author)

AD-750 687 PC$3.00/MF$0.95
Stanford Univ Calif Dept of Statistics
AN ASYMPTOTIC EXPANSION OF THE DISTRIBUTION OF THE 'STUDENTIZED' CLASSIFICATION STATISTIC W.
Technical rept.,
T. W. Anderson. 10 Sep 72, 18p Rept no. TR-9
Contract N00014-67-A-0112-0030

Descriptors: (*Sampling, Distribution functions), Population (Mathematics), Asymptotic series, Transformations (Mathematics), Polynomials, Set theory.
Identifiers: Normal density functions, Degrees of freedom.

AD-750 689 PC$3.00/MF$0.95
Stanford Univ Calif Dept of Statistics
SOME MEASURES FOR DISCRIMINATING BETWEEN NORMAL MULTIVARIATE DISTRIBUTIONS WITH EQUAL COVARIANCE MATRICES.
Technical rept.,
Herman Chernoff. 28 Aug 72, 17p Rept no. TR-73
Contract N00014-67-A-0112-0051

Descriptors: (*Multivariate analysis, Distribution functions), Matrix algebra, Measure theory, Probability, Theorems, Mathematical prediction.
Identifiers: Discriminate analysis, Discriminant functions, Normal density functions.

Suppose that a statistician is permitted access to data which are more precise under (H sub 1) than under (H sub 2) where each hypothesis specifies a multivariate normal distribution. He is also allowed a choice between additional data more precise under (H sub 1) than under (H sub 2) or data in which the reverse is true. In a previous paper it was shown that if a linear discriminant function is used there is a premium on selecting the additional data to be more precise under (H sub 1). In the paper this result is extended to the case where the likelihood-ratio test is used. The results involve several alternate measures for discriminating between normal multivariate distributions with unequal covariance matrices. (Author)

AD-750 691 PC$3.00/MF$0.95
Stanford Univ Calif Dept of Statistics
SEQUENTIAL COVERAGE IN GEOMETRICAL PROBABILITY.
Technical rept.,
Peter John Cooke. 3 Oct 72, 73p Rept no. TR-198
Contract N00014-67-A-0112-0053

Descriptors: (*Sequential analysis, Stochastic processes), Geometry, Distribution functions, Graphics, Theorems, Theses.
Identifiers: Stopping rules (Mathematics), Random processes, Sequential coverage, *Geometrical probability.

It is the aim of the report to introduce and discuss problems which the author has labeled sequential coverage problems. Such problems deal with random sets; that is, sets whose location and orientation in some space are determined by a random process. (Author)

AD-750 723 PC$3.00/MF$0.95
Purdue Univ Lafayette Ind Dept of Statistics
A PROBABILISTIC PROOF OF THE NORMAL CONVERGENCE CRITERION.
Technical rept.,
David Root, and H. Rubin. Oct 72, 11p Rept no. Mimeograph Ser-304
Contract N00014-67-A-0226-0008

Descriptors: (*Brownian motion, Statistical analysis), Random variables, Inequalities, Measure theory, Theorems, Convergence.
Identifiers: Central limit theorem, Imbeddings (Mathematics), Probability measures, Stopping times (Mathematics).

By embedding partial sum processes into Brownian motion, it is well known that the deMoivre-Laplace central limit theorem is a consequence of the strong law of large numbers. It is the purpose here to show that the embedding technique can be used to establish both the degenerate convergence criterion and the normal convergence criterion for triangular arrays of uniformly asymptotically negligible random variables. (Author)

AD-750 725 PC$3.00/MF$0.95
North Carolina Univ Chapel Hill Dept of Statistics
A METHOD FOR SEPARATION OF RESIDUAL AND INTERACTION EFFECTS IN CLASS CLASSIFICATIONS.
Technical rept.,
N. L. Johnson. Sep 72, 12p Rept no. Mimeo Ser-842 AROD-9778:4-M
Contract DAHC04-71-C-0042

Descriptors: (*Statistical analysis, Classification), Analysis of variance, Regression analysis, Random variables, Distribution functions, Statistical tests.
Identifiers: Normal density functions.

Consider a two-way cross-classification with factors R ('rows') and C ('columns') at r, c levels respectively and suppose that the expected value of an observation at the i-th level of R and the j-th level of C is represented in the form epsilon + (roh sub i) + (kappa sub j) + (rho kappa) sub ij. The last term represents the interaction effect between R and C, usually denoted in the abbreviated form RxC. Variability about this expected value is represented by addition of a random variable with zero expected value. It is usually assumed that these random variables are mutually independent and have a common variance. If there is only one observation for each of the rc combinations of levels of R and C it is not possible to estimate the common variance separately from the interaction effects. (author)

AD-750 757 PC$3.00/MF$0.95
Iowa Univ Iowa City Dept of Mathematics
LINEAR REALIZATION OF FINITE AUTOMATA.
Technical rept.,
Bernd Reusch. Sep 72, 59p Rept no. TR-62
Contract N00014-68-A-0500
Report on the Theory and Applications of Automaton Theory.

Descriptors: (*Mathematical logic, Theorems), (*Learning machines, Mathematical logic), Automata, Mapping (Transformations), Set theory, Matrix algebra.
Identifiers: *Automata theory, Partitions (Mathematics), Homomorphisms, Finite state machines, Sequential machines.

The paper presents a method for linear realization of automata when such exist. The basic tools employed are indexed partitions (as a way of writing certain mappings) and predecessor operations. The indexed partitions are studied in some detail and their connection to codes is explained. The method itself is simple and straightforward and contains no search steps. Only standard techniques of linear algebra, such as solving linear equations, are used. Examples are given to show the advantage of this method as compared with previously known ones. (Author)

AD-750 763 PC$3.00/MF$0.95
California Univ Los Angeles Plasma Physics Group
CALCULATION OF REFLECTION AND TRANSMISSION COEFFICIENTS FOR A CLASS OF ONE-DIMENSIONAL WAVE PROPAGATION PROBLEMS IN INHOMOGENEOUS MEDIA.
Technical rept.,
Alfredo Banos, Jr. Oct 72, 52p Rept no. PPG-124
Contract N00014-69-A-0200-4023

Descriptors: (*Partial differential equations, Wave functions), Wave functions, Hypergeometric functions, Integration, Transcendental functions, Complex variables, Numerical analysis, Plasma medium, Radio waves.
Identifiers: Helmholtz equation.

Making use of an extension of Langer's method, the authors have solved the one-dimensional Helmholtz equation w double primed + (K sub 0)squared g (z) w (z) = 0, (K sub 0) = 2 pi/ (lambda sub 0), in which (lambda sub 0) is the free space wavelength and in which g (z) represents any one of the three characteristic profiles depicted in Figure 1. The main objective of the paper is the computation of the reflection and transmission coefficients for such a family of profiles making use of one and the same method throughout. (Author)

AD-750 784 PC$3.00/MF$0.95
Brown Univ Providence R I Div of Applied Mathematics
AN APPLICATION OF MAXIMAL DISSIPATIVE SETS IN CONTROL THEORY,
Marshall Slemrod. 1972, 21p
Contract N00014-67-A-0191-0009, Grant DA-ARO-D-31-124-71-G1252

Descriptors: (*Adaptive control systems, Mathematical models), Linear systems, Hilbert space, Groups (Mathematics), Convex sets, Feedback, Theorems.
Identifiers: *Control theory, Feedback control, Semigroup theory.

Consider the linear control system in Hilbert space given by dx/dt = Ax + Bu. Here A is the infinitesimal generator of a C sub o semigroup of bounded linear operators T (t), t > or = O, on a real Hilbert space E. The author assumes that T (t) is such that norm//T (t)// (sub L (E,E)) < or = M (e sup (- omega t)) for some constants M > or = 1 and omega > O. B is a bounded linear operator from a real Hilbert space H to E and N (B) is properly contained in H. The author attempts to synthesize a feedback control u (t) = f (x (t)) whose active part is bounded, preserves the property of exponential asymptotic stability possessed by the uncontrolled system u = O, and is suboptimal in some sense. The synthesis is formally obtained but leads to a nonlinear singular evolution equation for the state variable X (t). The theory of maximal dissipative sets is then applied to show that the state evolution equation possesses a unique solution when the synthesis is modified in an appropriate multivalued way at the singularities. (Author)

AD-750 792 PC$3.00/MF$0.95
Bell Telephone Labs Inc Whippany N J
SOME DESIGN PROBLEMS ASSOCIATED WITH MULTIPLE REGRESSION.
Technical rept.,
A. C. Nelson, Jr., Kay K. Mazuy, and J. B. Tommerdahl. 18 Jun 63, 31p
Contract DA-30-069-ORD-1955
Prepared in cooperation with Research Triangle Inst., Durham, N. C., Rept. no. RTI-TR-SU-17-11.

Descriptors: (*Regression analysis, Experimental design), Mathematical models, Confidence limits, Logic circuits, Curve fitting, Graphics, Mathematical prediction, Correlation techniques, Reliability.
Identifiers: Parameter estimation, Normal density functions.

One of the most frequently occurring problems in the physical sciences is that of developing a mathematical model which relates the response to the independent variables of the system under study. One objective of a model may be the estimation of the response with the best possible precision throughout a given region of variation of the variables. Another may be to estimate one or more of the coefficients in the model with the best possible precision. The selection of the best design to meet these and other possible objectives was discussed by Kiefer and others. In the paper some problems associated with the development of mathematical models for the prediction of the performance of digital circuits are considered. (Author)

AD-750 857 Reprint
Indiana Univ Bloomington Dept of Mathematics
SOME VARIANTS OF CHI-SQUARE FOR TESTING UNIFORMITY ON THE CIRCLE,
J. S. Rao. 20 Sep 71, 13p AFOSR-TR-72-2024
Grant AF-AFOSR-2009-71
Revision of report dated 28 Jul 70.
Availability: Pub. in Z. Wahrscheinlichkeitstheorie verw. Geb. v22 p33-44 1972.

Descriptors: (*Statistical tests, Sampling), Distribution functions, Random variables, Asymptotic series.
Identifiers: Chi square test, Order statistics.

In the paper the problem of testing for uniformity on the basis of a set of observations on the circumference of a unit circle is considered. The classical chi-square test is modified to make it invariant under rotations of the circle. Two such modifications are considered and their limiting distributions are obtained. (Author)

AD-750 858 Reprint
Indiana Univ Bloomington Dept of Mathematics
ON SOME SELECTION PROCEDURES IN TWO-WAY LAYOUTS,
Madan L. Puri, and Pranab K. Sen. 21 Jun 71, 12p
AFOSR-TR-72-2025
Grants AF-AFOSR-2009-71, PHS-GM-12868-04
Prepared in cooperation with North Carolina Univ., Chapel Hill. Dept. of Biostatistics. Revision of report dated 26 Mar 70.
Availability: Pub. in Zeitschrift fuer Wahrscheinlichkeitstheorie und Verwandte Gebiete, v22 p242-250 1972.

Descriptors: (*Statistical analysis, Experimental design), Random variables, Stochastic processes, Theorems, Combinatorial analysis.
Identifiers: Block design, Robust procedures, Order statistics.

In the paper the authors consider some robust selection procedures for selecting a subset of t (< c) best treatments with or without regard to orders in a two-factor complete block design involving c (> or = 2) treatments. The authors also consider the problem of selecting all treatments which are at least as good as the standard one. The procedures considered are based on a class of robust estimates of treatment effects based on rank statistics and form an extension of the existing theory of Puri and Puri and others, to two-way lay out designs. (Author)

AD-750 863 PC$3.00/MF$0.95
Aerospace Corp El Segundo Calif Engineering Science Operations
ESTIMATION OF THE COVARIANCE PARAMETERS IN TIME-DISCRETE LINEAR SYSTEMS WITH APPLICATIONS TO ADAPTIVE FILTERING.
Technical operating rept.,
P. L. Smith. 31 May 71, 92p Rept no. TOR-0059 (6311)-23 SAMSO-TR-72-252
Contract F04701-70-C-0059

Descriptors: (*Adaptive control systems, Mathematical models), Linear systems, Stochastic processes, Random variables, Difference equations, Matrix algebra, Partial differential equations, Statistical analysis, Optimization.
Identifiers: *Kalman filters, Maximum likelihood estimation, Discrete time systems, Random walk, *Control theory, Automatic control, Stochastic control, Parameter estimation, Adaptive filters.

The Kalman filter sequentially generates the minimum variance estimate of the state of a linear dynamic system. This estimate is a function of the covariance parameters of the dynamic system model, which implies that these be known a priori. Unfortunately some or all of these covariance parameters are often unknown in engineering applications. Two methods of estimating the unknown covariance parameters are examined in the dissertation. The first method is to compute the maximum likelihood estimates of the unknown

covariance parameters from the measurement residuals generated by a sub-optimal sequential filter. The second method is to estimate the states and unknown covariance parameters from the measurements simultaneously. (Author)

AD-750 879 Reprint
IBM Watson Research Center Yorktown Heights N Y
FAST EVALUATION OF POLYNOMIALS BY RATIONAL PREPARATION,
Shmuel Winograd, and Michael O. Rabin. Dec 71, 26p
Contract N00014-69-C-0023
Prepared in cooperation with Hebrew Univ., Jerusalem.
Availability: Pub. in Communications on Pure and Applied Mathematics, v25 p433-458 1972.

Descriptors: (*Polynomials, Iterative methods), Approximation (Mathematics), Integration, Theorems.
Identifiers: Arithmetic, Rational functions.

In the article the authors study the number of additions and multiplications required to evaluate polynomials. (Author)

AD-750 880 Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
APPLICATIONS OF FUNCTION SPACE INTEGRALS TO PROBLEMS IN WAVE PROPAGATION IN RANDOM MEDIA,
Pao-Liu Chow. 2 Mar 72, 15p Rept no. NYU-ONR-H43
Contract N00014-67-A-0467-0006
Availability: Pub. in Jnl. of Mathematical Physics, v13 n8 p1224-1236 Aug 72.

Descriptors: (*Wave transmission, *Integral equations), High frequency, Partial differential equations, Boundary value problems, Initial value problems, Integration, Refractive index, Thermal radiation.
Identifiers: Wave equations.

Two problems in wave propagation governed by the reduced wave equation with a random refractive index are studied. Problem (a) is concerned with radiation from a source in an infinite medium, and problem (b) pertains to the scattering by a random half-space at high frequencies. By transforming the reduced wave equation into a generalized heat equation, it becomes possible to express the moments of solutions in terms of Wiener integrals. Concrete results are obtained for certain special cases. By systematically approximating the functional integral representation for the moments, various perturbation equations come fourth. Among them is Kraichnan's direct interaction approximation. By examining the errors involved, the accuracy in each approximation is ascertained and the nature of the approximation becomes transparent. (Author)

AD-750 973 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
TRUNCATED POWER SERIES CONTROL REPRESENTATIONS FOR OPTIMIZATION OF DYNAMIC SYSTEMS.
Technical rept. 1 Sep 70-1 May 72,
Austin L. Foote. Aug 72, 161p Rept no. DS/EE/72-2 AFAL-TR-72-191
Doctoral thesis. Supersedes report dated Jun 72, AD-748 312.

Descriptors: (*Adaptive control systems, Mathematical models), Power series, Linear systems, Nonlinear systems, Partial differential equations, Inequalities, Feedback, Costs, Matrix algebra, Optimization, Algorithms, Theses.
Identifiers: *Control theory, Automatic control, Feedback control, Time varying systems, Penalty functions, Constraints.

The set of candidate controls for the solution of an optimal control problem is defined as a finite set of constant coefficient truncated power series. The variables present in the truncated power series are limited to the state variables in the system and the independent variable time. The control solution may thus be limited to a form which can be simply and inexpensively implemented into a system. Multistage optimal control problems with both equality and inequality boundary conditions are considered. A set of necessary conditions and a set of sufficient conditions for a relative minimum solution are developed for an optimal control problem with equality constraints. Solutions to the equations comprising these necessary conditions can be obtained using recursive algorithms. A method called the vector cost method is developed to obtain quasi-optimal solutions to optimal control problem with equality constraints is defined whose solution is a quasi-optimal solution to the original problem. (Author)

AD-751 004 Reprint
Rice Univ Houston Tex Aero-Astronautics Group
NUMERICAL SOLUTIONS IN THE SIMPLEST PROBLEM OF THE CALCULUS OF VARIATIONS,
Angelo Miele, and Robert E. Pritchard. 26 Aug 71, 14p AFOSR-TR-72-2069
Grant AF-AFOSR-828-67
Revision of report dated 6 May 71.
Availability: Pub. in SIAM Review, v14 n3 p385-398 Jul 72.

Descriptors: (*Calculus of variations, Numerical analysis), Iterative methods, Algorithms.

The paper deals with the numerical techniques for solving the simplest problem in the calculus of variations. Both first-variation methods and second-variation methods are reviewed. Concerning first-variation methods, a direct approach and an indirect approach are given. They both cause a reduction of the integral at each iteration. Concerning second-variation methods, two possibilities are explored: (i) reduction of the integral and (ii) reduction of the performance index. In case (i), two viewpoints are employed: (a) minimization of the sum of the first variation and the second variation, and (b) minimization of the first variation for a given second variation. In case (ii), two viewpoints are employed: (a) quasi-linearization of the Euler equation, and (b) descent process on the performance index. (Author)

AD-751 006 Reprint
California Univ Santa Barbara Dept of Mathematics
RATIONAL TENSOR REPRESENTATIONS OF HOM (V, V) AND AN EXTENSION OF AN INEQUALITY OF I. SCHUR,
Marvin Marcus, and William Robert Gordon. 16 Nov 71, 12p AFOSR-TR-72-2072
Grant AF-AFOSR-698-67
Revision of report dated 4 Aug 71.
Availability: Pub. in Canadian Jnl. of Mathematics, v24 n4 p686-695 1972.

Descriptors: (*Matrix algebra, Inequalities), (*Inequalities, Tensor analysis), Vector spaces, Theorems.
Identifiers: Schur inequality.

A generalization of some recently obtained inequalities for non-normal matrices is obtained. The method depends on the structure of certain rational tensor representations of the multiplicative monoid of n-square complex matrices. (Author)

N72-28197 PC$3.50/MF$0.95
Bolt, Beranek, and Newman, Inc., Cambridge, Mass.
ROBOT COMPUTER PROBLEM SOLVING SYSTEM.
Quarterly Progress Report, 23 Feb. - 22 May 1972
J. D. Becker. 15 Jun 72, 26p NASA-CR-127445, QPR-3
Contract NASW-2236

Descriptors: *Behavior, *Computer programming, *Control theory, *Robots, Artificial intelligence, Communication theory, Cybernetics, Feedback control.

For abstract, see STAR 10 19.

N72-28248 PC$9.00/MF$0.95
Technische Hochschule, Darmstadt (West Germany). Facultat Fuer Elektrotechnik.
ON THE SYNTHESIS OF TIME OPTIMAL AND TIME SUBOPTIMAL REGULATION OF SYSTEMS WITH RELAY CONTROLLED, MOTORIZED FINAL CONTROL ELEMENTS . ZUR SYNTHESE ZEITOPTIMALER UND ZEITSUBOPTIMALER REGELUNGEN BEI SYSTEMEN MIT RELAISGESCHALTETEN MOTORISCHEN STELLGLIEDERN.
Ph.D. Thesis
L. Borsi. 16 Dec 71, 136p DISS-17

Descriptors: *Control equipment, *Control theory, *Feedback control, *Optimal control, Linear systems, Nonlinear systems, Numerical analysis, Systems analysis.

For abstract, see STAR 10 19.

N72-28589 PC$3.00/MF$0.95
College of William and Mary, Williamsburg, Va. Dept. of Mathematics.
A SHORT PROOF OF MACLANES PLANARITY THEOREM.
P. V. Oneil. 1970, 4p NASA-CR-127463
Contract NGL-47-006-055

Descriptors: *Graphs (charts), *Imbeddings (mathematics), Branching (mathematics), Theorem proving.

For abstract, see STAR 10 19.

N72-28591 PC$4.75/MF$0.95
Electrotechnical Lab., Tokyo (Japan).
NUMERICAL METHODS FOR THE ABEL INVERSION.
A. Yaoita. Nov 71, 55p CIRC-172
LANG- IN JAPANESE ENGLISH SUMMARY

Descriptors: *Integral equations, *Numerical integration, Polynomials, Problem solving.

For abstract, see STAR 10 19.

N72-28703 PC$3.00/MF$0.95
National Research Council of Canada, Ottawa (Ontario).
PRIME IDEALS IN THE WITT RING.
F. Lorenz, and J. Leicht. 1972, 13p NRC-TT-1565 Tran- Transl. Into English From Invent. Math. (West Germany), V. 10, No. 1 1970 P 82-88

Descriptors: *Quadratic equations, *Rings (mathematics), Algebra, Group theory.

For abstract, see STAR 10 19.

N72-29158 PC$3.00/MF$0.95
State Univ. of New York, Stony Brook. Coll. of Engineering.
SORTING AND ORDERING SPARSE LINEAR SYSTEMS.
R. P. Tewarson. Jan 70, 20p NASA-CR-127767, REPT-151
Contract NGR-33-015-013
Conf- Presented At Conf. on Large Sparse Sets of Linear Equations, Oxford, England, 5-8 Apr. 1970

Descriptors: *Algorithms, *Linear systems, *Set theory, *Transformations, Linear transformations, Matrices (mathematics).

For abstract, see STAR 10 20.

N72-29163 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
IBM SYSTEM/360 ASSEMBLY LANGUAGE INTERVAL ARITHMETIC SOFTWARE.
E. J. Phillips. Apr 72, 20p NASA-TM-X-65971, X-552-72-147

Descriptors: *Assembly language, *Error analysis, *Ibm 360 computer, Computer systems programs, Intervals, Set theory.

For abstract, see STAR 10 20.

N72-29174 PC$3.00/MF$0.95
Connecticut Univ., Storrs. Dept. of Electrical Engineering.
A NOTE ON POLE ASSIGNMENT.
B. Sridhar, and D. P. Lindorff. Apr 72, 10p NASA-CR-127763, TR-72-2
Contract NGL-07-002-002

Descriptors: *Electric power transmission, *Feedback control, Feedback circuits, Linear systems, Multivariate statistical analysis.

For abstract, see STAR 10 20.

N72-29195 PC$9.50/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Decision and Control Sciences Group.
ADAPTIVE CONTROL OF STOCHASTIC LINEAR SYSTEMS WITH UNKNOWN PARAMETERS.
M.S. Thesis
R. T. Ku. May 72, 148p NASA-CR-127786, ESL-R-477
Contracts NGL-22-009-124, AF-AFOSR-1941-70

Descriptors: *Adaptive control, *Feedback control, *Linear systems, *Optimal control, *Stochastic processes, Control theory, Independent variables, Kalman-schmidt filtering.

For abstract, see STAR 10 20.

N72-29196 PC$11.00/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Electronic Systems Lab.
OPTIMAL CONTROL OF FIRST ORDER DISTRIBUTED SYSTEMS.
Ph.D. Thesis
T. L. Johnson. May 72, 179p NASA-CR-127799, ESL-R-482
Contracts NGL-22-009-124, NSF GK-25781

Descriptors: *Control theory, *Distribution functions, *Optimal control, *Optimization, Applications of mathematics, Dependent variables, Partial differential equations.

For abstract, see STAR 10 20.

N72-29199 PC$3.00/MF$0.95
Centre National de La Recherche Scientifique, Toulouse (France). Lab. Dautomatique Et de Ses Applications Spatiales.
STUDY OF RECURRENCE RELATIONSHIPS AND THEIR APPLICATIONS BY THE LABORATOIRE DAUTOMATIQUE ET DE SES APPLICATIONS SPATIALES.
J. Lagasse, and C. Mira. 1971, 14p
LAAS-PUBL-913

Descriptors: *Liapunov functions, *Nonlinear equations, *Problem solving, *Recursive functions, *Stability, Data sampling, Differential equations, Dynamic control, Numerical analysis, Periodic functions, Variational principles.

For abstract, see STAR 10 20.

N72-29620 PC$3.00/MF$0.95
Brown Univ., Providence, R.I.
OSCILLATIONS IN NEUTRAL FUNCTIONAL DIFFERENTIAL EQUATIONS.
J. K. Hale. 15 Jun 72, 14p NASA-CR-127803
Contracts NGL-40-002-015, AF-AFOSR-2078-71

Descriptors: *Boundary value problems, *Differential equations, *Oscillations, Fredholm equations, Linear equations.

For abstract, see STAR 10 20.

N72-29622 PC$3.25/MF$0.95
Techtran Corp., Glen Burnie, Md.
INTERFERING PARAMETERS IN A SCHEME OF LINEAR REGRESSION.
V. L. Miazo. Aug 72, 22p NASA-TT-F-14378, PR-89
Contract NASW-2037
Tran- Transl. Into English of Meshayushchiye Parametry V Skheme Lineynoy Regressii Rept. Pr-89 Acad. Sci. USSR, Moscow, 1972 27 P

Descriptors: *Least squares method, *Regression analysis, *Theorem proving, Orbital position estimation, Spacecraft trajectories.

For abstract, see STAR 10 20.

N72-29623 PC$3.50/MF$0.95
Smithsonian Astrophysical Observatory, Cambridge, Mass.
COMPUTATION OF HANSEN COEFFICIENTS.
J. R. Cherniack. 27 Jul 72, 30p NASA-CR-127383, SAO-SPECIAL-REPT-346
Contract NGR-09-015-002

Descriptors: *Coefficients, *Computer techniques, Hansen lunar theory, Tables (data).

For abstract, see STAR 10 20.

N72-29628 PC$4.75/MF$0.95
National Physical Lab., Teddington (England). Div. of Numerical Analysis and Computing.
SOLUTION OF MIXED BOUNDARY VALUE PROBLEMS IN FINITE DOMAINS BY FOURIERS METHOD.
D. H. Ferriss. Apr 72, 53p NPL-NAC-16

Descriptors: *Boundary value problems, *Finite element method, *Fourier series, *Mixing length flow theory, *Problem solving, Composite materials, Differential equations, Eigenvalues, Eigenvectors, Shear stress, Two dimensional flow.

For abstract, see STAR 10 20.

N72-29629 PC$8.75/MF$0.95
National Physical Lab., Teddington (England). Div. of Numerical Analysis and Computing.
THE IMPLEMENTATION OF TWO REVISED QUASI-NEWTON ALGORITHMS FOR UNCONSTRAINED OPTIMIZATION.
P. E. Gill, W. Murray, and R. A. Pitfield. Apr 72, 135p NPL-NAC-11

Descriptors: *Algol, *Algorithms, *Approximation, *Newton-raphson method, *Optimization, Finite difference theory, Iteration, Matrices (mathematics), Steepest descent method, Truncation errors.

For abstract, see STAR 10 20.

N72-30218 PC$7.25/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Electronic Systems Lab.
ON A STOCHASTIC CONTROL METHOD FOR WEAKLY COUPLED LINEAR SYSTEMS.
M.S. Thesis
R. H. Kwong. May 72, 103p NASA-CR-127910, ESL-R-480
Contracts NGL-22-009-124, AF-AFOSR-1941-70

Descriptors: *Control theory, *Linear systems, *Stochastic processes, Matrices (mathematics), Optimal control, Signal to noise ratios.

For abstract, see STAR 10 21.

N72-30219 PC$3.50/MF$0.95
Connecticut Univ., Storrs. Dept. of Electrical Engineering.
DESIGN OF MINIMAX OUTPUT FEEDBACK CONTROLLER FOR SYSTEM WITH PARAMETER UNCERTAINTY.
S. Basuthakur, and C. H. Knapp. Jun 72, 27p NASA-CR-127814, TR-72-4
Contract NGL-07-002-002

Descriptors: *Controllers, *Feedback, *Minimax technique, *Systems engineering, Algorithms, Linear systems, Optimization, Probability theory.

For abstract, see STAR 10 21.

N72-30235 PC$13.50/MF$0.95
Office National Detudes Et de Recherches Aerospatiales, Paris (France).
RANDOM PROCESSES WITH CONTROL AND APPLICATIONS OPTIMIZATION . PROCESSUS ALEATOIRES A COMMANDE ET APPLICATIONS A LOPTIMISATION STOCHASTIQUE.
Ph.D. Thesis - Paris Univ.
C. Aumasson. 1972, 228p ONERA-P-141
LANG- IN FRENCH ENGLISH SUMMARY

Descriptors: *Mathematical models, *Optimal control, *Random processes, *Stochastic processes, Dynamic programming, Feedback control, Game theory, Operations research, Servocontrol, Statistical decision theory, Systems engineering.

For abstract, see STAR 10 21.

N72-30236 PC$5.50/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Brunswick (West Germany). Abteilung Flugmechanik Der Luftfahrzeuge.
INVESTIGATION OF THE TRANSFER BEHAVIOR OF MULTIVARIABLE SYSTEMS USING EIGENVECTORS . UNTERSUCHUNG DES UEBERTRAGUNGSVERHALTENS VON MEHRGROESSENSYSTEMEN MIT HILFE DER EIGENVEKTOREN.
G. Rosenau. Feb 72, 68p DLR-FB-72-28
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Eigenvectors, *Flight mechanics, *Systems analysis, Differential calculus, Feedback control, Independent variables, Linear systems, Matrices (mathematics).

For abstract, see STAR 10 21.

N72-30526 PC$3.00/MF$0.95
Michigan Univ., Ann Arbor. Logic of Computers Group.
COMPARISON OF GENETIC ALGORITHMS WITH CONJUGATE GRADIENT METHODS.
J. L. Bosworth, N. Y. Foo, and B. P. Zeigler. Aug 72, 44p NASA-CR-2093, REPT-003120-1-T
Contract NGR-23-005-427

Descriptors: *Algorithms, *Functions (mathematics), *Optimization, *Search profiles, Gradients, Ibm computers.

For abstract, see STAR 10 21.

N72-30527 PC$3.00/MF$0.95
Michigan Univ., Ann Arbor. Logic of Computers Group.

ALGEBRAIC, GEOMETRIC, AND STOCHASTIC ASPECTS OF GENETIC OPERATORS.
N. Y. Foo, and J. L. Bosworth. Aug 72, 61p
NASA-CR-2099, REPT-003120-2-T
Contract NGR-23-005-427

Descriptors: *Algorithms, *Functions (mathematics), *Operators (mathematics), *Optimization, Computer programming, Conversion, Crossovers, Mathematical logic, Number theory.

For abstract, see STAR 10 21.

N72-30531 PC$4.25/MF$0.95
IBM Watson Research Center, Yorktown Heights, N.Y.
DESIGN OF AUTOMATA THEORY OF CUBICAL COMPLEXES WITH APPLICATIONS TO DIAGNOSIS AND ALGORITHMIC DESCRIPTION.
Final Report
J. P. Roth. 11 Apr 72, 43p NASA-CR-127887, RC-3814
Contracts NAS7-100, JPL-952709
Subm- Prepared for Jpl

Descriptors: *Algorithms, *Logic design, Large scale integration, Optimization.

For abstract, see STAR 10 21.

N72-30533 PC$5.25/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
KULLBACK-LEIBLER INFORMATION FUNCTION AND THE SEQUENTIAL SELECTION OF EXPERIMENTS TO DISCRIMINATE AMONG SEVERAL LINEAR MODELS.
S. M. Sidik. 17 Aug 72, 61p NASA-TM-X-68108
Conf- Presented At Ann. Meeting of Am. Statist. Assoc., Montreal, 14-17 Aug. 1972

Descriptors: *Information, *Sampling, *Statistical distributions, Monte carlo method, Simulation.

For abstract, see STAR 10 21.

N72-30540 PC$3.75/MF$0.95
Syracuse Univ., N.Y. Dept. of Physics.
SHEAR FREE, TWISTING EINSTEIN-MAXWELL METRICS IN THE NEWMAN-PENROSE FORMALISM.
R. W. Lind. Jul 72, 34p NASA-CR-127867
Contract NSF GP-19378
Subm- Sponsored in Part By Nasa

Descriptors: *Algebra, *Coefficients, *Einstein equations, *Maxwell equation, Differential equations.

For abstract, see STAR 10 21.

PB-212 443 PC$3.00/MF$0.95
Rice Univ., Houston, Tex. Aero-Astronautics Group.
METHOD OF DUAL MATRICES FOR FUNCTION MINIMIZATION,
H. Y. Huang. 1972, 34p AAR-88
Grant NSF-GP-32453

Descriptors: (*Mathematical programming, Computation), (*Functions (Mathematics), Optimization), Matrices (Mathematics), Algorithms.
Identifiers: Dual matrices.

In the paper, the method of dual matrices for the minimization of functions is introduced. The method, which bypasses the one-dimensional search for the stepsize, is characterized by employing two matrices at each iteration. One matrix is such that a linearly independent set of directions can be generated, regardless of the stepsize employed. The other matrix is such that, at the point where the first matrix fails to yield a linearly independent gradient, it generates a displacement leading to the minimal point. Thus, the one-dimensional search is completely bypassed. For a quadratic function, it is proved that the minimal point is obtained at most n + 1 iterations, where n is the number of variables in the function. Since the one-dimensional search is not needed, the total number of gradient evaluations for convergence is at most n + 2. This represents a saving on the total computational effort versus 2n + 1 gradient evaluations required by the conventional quadratically convergent algorithms. (Author)

PB-212 532 PC$3.00/MF$0.95
California Univ., Berkeley. Operations Research Center.
THE COMPUTATIONAL SOLUTION OF OPTIMAL CONTROL PROBLEMS WITH TIME LAG,
Stuart E. Dreyfus. Sep 72, 12p ORC-72-21
Grant NSF-GP-30961X

Descriptors: (*Control theory, Time lag), Automatic control, Dynamic programming, Partial differential equations, Optimization, Computation.
Identifiers: Discrete time systems.

A gradient computational procedure is developed for discrete-time optimal control problems in which the current cost and rule governing state transitions depend on the entire past history of states and decisions. A condition necessary for optimality is also deduced, in two ways, and given physical interpretation. (Author)

PB-212 650 PC$3.00/MF$0.95
Acta Polytechnica Scandinavica, Stockholm (Sweden).
EIGENFUNCTIONALS OF THE ONE-DIMENSIONAL TRANSPORT OPERATOR IN MODAL APPROXIMATIONS.
Physics including nucleonics series,
Pekka Silvennoinen. 22 Feb 72, 21p APS-PH-87
Paper copy also available from: The Finnish Academy of Technical Sciences, Lonnrotinkatu 37, 00180 Helsinki 18 (Finland). Fmk 8.00.

Descriptors: (*Transport theory, Eigenfunctions), Boltzmann equation, Differential equations, Integral equations, Sweden, Approximation.

Eigendistributions of the linear Boltzmann operator are constructed in modal approximations. The formalism is a generalization of the conventional multigroup theory. Eigendistributions consist of the principal value functionals and the derivatives of the delta-distribution. The customary proof of completeness of the normal modes is not applicable here. In a simple case of symmetric scattering an auxiliary set of functionals is shown to be complete when augmented with the ordinary discrete eigenfunctions. (Author)

PB-212 652 PC$3.00/MF$0.95
Acta Polytechnica Scandinavica, Stockholm (Sweden).
POLYNOMIAL OPERATORS FOR NONLINEAR SYSTEMS ANALYSIS.
Mathematics and computing machinery series,
Aarno Halme. 1972, 66p APS-MA-24
Paper copy also available from: The Finnish Academy of Technical Sciences, Lonnrotinkatu 37, 00180 Helsinki 18 (Finland). Fmk 8.00.

Descriptors: (*Control theory, Nonlinear systems), (*Functional analysis, Nonlinear systems), Systems analysis, Mathematical models, Polynomials, Automatic control, Sweden, Banach space, Nonlinear differential equations.

The concept of polynomial operators is considered and applied to the analysis of nonlinear dynamical systems, especially for purposes of automatic control. The approach is functional analytic, which makes it possible to apply the theory widely to most systems characterized by a polynomial type nonlinearity. The main result is a theorem concerning local invertibility of polynomial operators although also other important algebraic and topological properties are derived. The theorem shows how a local inverse can be constructed by a recursive representation and gives an explicitly determinable validity region for this representation. Applications are presented concerning differential equations with polynomial type generators, generally defined in Banach spaces. The local inverse theorem is used to find the solutions and to investigate stability and controllability properties of these equations. As an example the swing equation of a synchronous machine is considered. (Author)

12B. Operations Research

AD-750 409 PC$3.00/MF$0.95
George Washington Univ Washington D C Program in Logistics
THE TWO-MACHINE FLOW-SHOP WITH RANDOM PROCESSING TIMES,
Mark Brown, and Hamilton Emmons. 11 Aug 72, 22p Rept no. Serial-T-269
Contract N00014-67-A-0214-0001

Descriptors: (*Scheduling, Machine shop practice), Stochastic processes, Sequences, Random variables, Distribution functions, Theorems.
Identifiers: *Job scheduling, Job shop scheduling, Random processes.

The authors consider the problem of sequencing n jobs in a simple two-machine flow-shop with the objective of finding a schedule with stochastically smallest makespan. Results are derived under a special stochastic structure for the processing time distributions. (Author)

AD-750 539 PC$3.00/MF$0.95
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
ON A SOLUTION AND A GENERALIZATION OF THE CIGARETTE SMOKERS' PROBLEM,
Nico Habermann. Aug 72, 26p AFOSR-TR-72-1992
Contract F44620-70-C-0107

Descriptors: (*Operations research, Problem solving), Programming (Computers), Mathematical models, Theorems.
Identifiers: *Cigarett smokers problem, Semaphores.

The author of the Cigarette Smokers' Problem (S. Patil, MIT) tried to show that the problem could not be solved using Dijkstra's P- and V-operations without conditional statements. D. L. Parnas (CMU) showed that Patil's proof was false by presenting a solution using P- and V-operations, but no conditional statements. The paper presents first a correctness proof of Parnas' solution. This solution leads to an obvious generalization and in connection with it the question of an optimal set of distinguishable codewords is addressed. Finally a more natural approach to the problem is discussed and a solution for this variation is presented with its correctness proof. (Author)

AD-750 673 PC$3.00/MF$0.95
Stanford Univ Calif Dept of Operations Research
EXPERIMENTS ON THE COMPARATIVE EFFICIENCY OF THE VARIOUS VARIANTS OF THE STANDARD SIMPLEX ALGORITHM.
Technical rept.,
Yoram Yakimovsky. Aug 72, 7p Rept no. TR-72-17
Contract N00014-67-A-0112-0011, Grant NSF-GP-31393
Sponsored in part by Atomic Energy Commission, Contract AT (04-3)-326.

Descriptors: (*Simplex method, Algorithms), Iterations, Matrix algebra, Statistical analysis.

The choice of the entering basic variable in the simplex algorithm has a major effect on the efficiency of the simplex algorithm. The paper summarizes some statistical experiments on the effect of the different choice criteria on the number of required iterations to get the optimum for randomly generated problems. (Author)

AD-750 674 PC$3.00/MF$0.95
Stanford Univ Calif Dept of Operations Research
FOURIER-MOTZKIN ELIMINATION AND ITS DUAL.
Technical rept.,
George B. Dantzig. Sep 72, 12p Rept no. TR-72-18
Contract N00014-67-A-0112-0011, Grant NSF-GP-31393
Sponsored in part by Atomic Energy Commission, Contract AT (04-3)-326.

Descriptors: (*Linear programming, *Inequalities), Theorems.
Identifiers: Linear inequalities, Integer programming, Motzkin theorem, Fourier-Motzkin method, Duality theory.

Research on linear inequalities systems prior to 1947 consisted of isolated efforts by a few investigators. A case in point is the elimination technique for reducing the number of variables in the system. A description of the method can be found in Motzkin's 1936 Ph.D. thesis. It differs from its analog for systems of equations in that (unfortunately) each step in the elimination can greatly increase the number of inequalities in the remaining variables. For years the method was referred to as the Motzkin Elimination Method. However, because of the odd grave-digging custom of looking for artifacts in long forgotten papers, it is now known as the Fourier-Motzkin Elimination Method. In the paper the author reviews the elimination scheme and shows that a dual form of the method is a technique for reducing the number of equations in a system of equations in non-negative variables. Some comments regarding its applicability to integer programs also made. (Author)

AD-750 676 PC$3.00/MF$0.95
Stanford Univ Calif Operations Research House
GENERALIZED UPPER BOUNDS AND TRIANGULAR DECOMPOSITION IN THE SIMPLEX METHOD.
Technical rept.,
John A. Tomlin. Sep 72, 10p Rept no. TR-72-20
Contract N00014-67-A-0112-0011

Descriptors: (*Linear programming, Algorithms), Simplex method, Transformations (Mathematics), Matrix algebra, Optimization.
Identifiers: Decomposition method, Generalized upper bound algorithm.

Two recent advances in linear programming have been the very successful implementation of the Generalized Upper Bound (GUB) algorithm, due to Dantzig and Van Slyke and the new methods for updating triangular factors of the basis in the Simplex Method (Bartels, Forrest and Tomlin). The purpose of the note is to show that despite the special basis inverse manipulation involved in one step of the GUB algorithm these two techniques can be successfully combined. (Author)

AD-750 677 PC$3.00/MF$0.95
Stanford Univ Calif Operations Research House
ON PRICING AND BACKWARD TRANSFORMATION IN LINEAR PROGRAMMING.
Technical rept.,
J. A. Tomlin. Sep 72, 15p Rept no. TR-72-21
Contract N00014-67-A-0112-0011

Descriptors: (*Linear programming, Algorithms), Simplex method, Transformations (Mathematics), Vector spaces, Iterations.
Identifiers: Constraints.

In the paper the author re-examines some of the available methods for pricing out the columns in the simplex method and point out their potential advantages and disadvantages. In particular it is shown that a simple formula for updating the pricing vector can be used with some advantage in the standard product form simplex algorithm and with very considerable advantage in two recent developments: P. M. J. Harris's dynamic scaling method and the Forrest-Tomlin method for maintaining triangular factors of the basis. (Author)

AD-750 678 PC$3.00/MF$0.95
Stanford Univ Calif Dept of Operations Research
ON THE RELATION OF OPERATIONS RESEARCH TO MATHEMATICS.
Technical rept.,
George B. Dantzig. Sep 72, 10p Rept no. TR-72-23
Contract N00014-67-A-0112-0011, Grant NSF-GP-31393
Presented as part of a panel talk before the American Mathematics Society, held in Atlantic City, N. J., on 23 Jan 71. Sponsored in part by Atomic Energy Commission, Contract AT (04-3)-326.

Descriptors: (*Operations research, Reviews), Numerical analysis, Statistical analysis, Mathematical programming, Combinatorial analysis.

The report reviews operations research and how it may be used by mathematicians for solving new and unsolved problems and for developing new mathematical theories.

AD-750 688 PC$3.00/MF$0.95
Stanford Univ Calif Dept of Operations Research
LIMIT THEOREMS FOR FINITE DAMS.
Technical rept.,
Douglas P. Kennedy. Aug 72, 18p Rept no. TR-25
Contract N00014-67-A-0112-0031, Grant NSF-GP-31392X

Descriptors: (*Stochastic processes, Convergence), (*Dams, Queueing theory), Mathematical models, Topology, Random variables, Traffic, Measure theory, Theorems.
Identifiers: Probability measures, Weak convergence, Limit theorems, Wiener processes, Martingales.

Limit distributions are given for both the dam content at time n and the limiting dam content in the nth dam, as n approaches infinity, for a sequence of finite dams in discrete time, under assumptions which correspond to the various cases of heavy traffic in queueing theory. The proof employed is an application of the theory of weak convergence of probability measures. (Author)

N72-28590 PC$8.25/MF$0.95
Technische Hochschule Hannover (West Germany). Fakultaet Fuer Mathematik Und Naturwissenschaften.
THE TRANSFORMATION PROBABILITIES OF LIMITED POISSON WAITING PROCESSES WITH STATE DEPENDENT PARAMETERS AND PREEMPTIVE REPEAT PRIORITIES . DIE UEBERGANGSWAHRSCHEINLICHKEITEN BESCHRAENKTER POISSONSCHER WARTEPROZESSE MIT ZUSTANDSABHAENGIGEN PARAMETERN UND PREEMPTIVE-REPEAT-PRIORITAEN.
Ph.D. Thesis
D. Lohse. 1971, 124p

Descriptors: *Matrix methods, *Poisson density functions, *Queueing theory, Linearization, Operations research, Sequencing, Stochastic processes.

For abstract, see STAR 10 19.

N72-28592 PC$3.25/MF$0.95
Laboratoire Dautomatique Et de Ses Applications Spatiales, Toulouse (France).
DETERMINATION OF A MINIMUM OR QUASI-MINIMUM SET OF KNOTS ENABLING THE INTERRUPTION OF ALL THE CIRCUITS IN A DIRECTED GRAPH . DETERMINATION DUN ENSEMBLE MINIMAL OUQUASI MINIMAL DE SOMMETS PERMETTANT DE COUPER TOUS LES CIRCUITS DUN GRAPHE ORIENTE.
M. Diaz, J. P. Richard, and M. Courvoisier. Mar 72, 24p LAAS-SL-72-I-06

Descriptors: *Equivalent circuits, *Network analysis, *Optimization, Decision theory, Diagrams, Graphs (charts).

For abstract, see STAR 10 19.

N72-29630 PC$3.25/MF$0.95
Technische Hogeschool, Eindhoven (Netherlands). Dept. of Electrical Engineering.
ADAPTIVE RANDOM SEARCH.
J. Kregting, and R. C. White, Jr. Oct 71, 24p TH-71-E-24

Descriptors: *Algorithms, *Functions (mathematics), *Optimization, *Random processes, *Searching, Adaptation, Problem solving.

For abstract, see STAR 10 20.

PB-212 444 PC$3.00/MF$0.95
Rice Univ., Houston, Tex. Aero-Astronautics Group.
NUMERICAL EXPERIMENTS ON DUAL MATRIX ALGORITHMS FOR FUNCTION MINIMIZATION,
H. Y. Huang, and J. P. Chambliss. 1972, 34p AAR-89
Grant NSF-GP-32453

Descriptors: (*Mathematical programming, Numerical analysis), (*Functions (Mathematics), Optimization), Matrices (Mathematics), Iteration, Algorithms.
Identifiers: Dual matrices.

Four algorithms of dual matrices for function minimization introduced in another paper are tested through several numerical examples. Three quadratic functions and five nonquadratic functions are investigated. For quadratic functions, the results show that the convergence is achieved in at most n + 1 iterations, where n is the number of variables. Since the one-dimensional search is not needed in these algorithms, the total number of gradient evaluations for convergence is at most n + 2. This represents a saving on the gradient evaluations versus 2n + 1 required by conventional quadratically convergent algorithms. For nonquadratic functions, the results show that these algorithms are very stable and efficient. Also, the effects of the stepsize factor on these algorithms are investigated. (Author)

PB-212 533 PC$3.00/MF$0.95
California Univ., Berkeley. Operations Research Center.
THE APPLICATION OF L-STRATEGIES TO GAME THEORY,
Theodore F. Driggers. Sep 72, 91p ORC-72-22
Grant NSF-GP-30961X

Descriptors: (*Game theory, Strategy), Differential games, Statistical decision theory, Probability distribution functions, Matrix games, Saddle points (Game theory), Dynamic programming, Linear programming, Theorems, Optimization.
Identifiers: Zero sum games, Nonzero sum games, *Two person games.

An aspect of game theory that has received very little attention to date is how to take advantage of nonoptimal play of an opponent. One approach to this problem, similar to Bayesian statistical decision theory, is to assign a probability distribution over the opponent's strategy space, and maximize

the expected value of the payoff with respect to this distribution, subject to the constraint of a lower bound on the expected payoff, regardless of the opponent's strategy. This approach is studied for classical zero-sum games, nonzero-sum games, and finite differential games. Computational procedures are discussed for each case. (Author)

PB-212 548 PC$3.00/MF$0.95
Cornell Univ., Ithaca, N.Y. Dept. of Computer Science.
COERCIVITY CONDITIONS IN NONLINEAR COMPLEMENTARITY PROBLEMS.
Technical rept.,
Jorge J. More. Sep 72, 40p CU-CSD-72-146
Grant NSF-GJ-27528

Descriptors: (*Nonlinear programming, Inequalities), Convex sets, Matrices (Mathematics), Theorems.
Identifiers: *Complementarity problem.

If F : (R sup n) to (R sup n) is a continuous mapping on a closed, convex cone K or (R sup n), it is shown that very weak restrictions on the growth of F (coercivity conditions) guarantee the existence of a solution to the nonlinear complementarity problem: For each z in (R sup n) find an x* in K such that Fx* - z belongs to the polar of K and x* is orthogonal to Fx* - z. If K is (R sup n) then this problem reduces to finding conditions on F which guarantee that F maps (R sup n) onto (R sup n). (Author)

PB-212 707 PC$3.00/MF$0.95
Michigan Univ., Ann Arbor. Computer, Information and Control Engineering.
NEW DIRECTIONS IN SYSTEM SCIENCE AND ENGINEERING. REPORT OF A WORKSHOP HELD AT THE UNIVERSITY OF MICHIGAN, ANN ARBOR, MICHIGAN ON FEBRUARY 14, 15 1972,
Louis Kazda, and A. Zadeh. 15 Feb 72, 29p
Grant NSF-GK-31312

Descriptors: (*Systems engineering, Mathematical models), Systems management, Systems analysis, Applications of mathematics, Research projects, Meetings.
Identifiers: Systems theory.

The Workshop on New Directions in System Science and Engineering was held on February 14 and 15, 1972, at the Chrysler Center of The University of Michigan. The principal objectives of the Workshop were the following. (1) To assess the current status of system science and engineering and identify problem areas that are in need of special attention; (2) To explore the relevance of system science and engineering to the solution of problems generated by the impact of technological progress on society; and, (3) To recommend policies which could contribute to the development of system science and engineering into an effective tool for the analysis and synthesis of large-scale systems, with the aim of enhancing its applicability to the solution of critical societal problems involving public systems and institutions.

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

AD-750 928 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
SHELL-AND-TUBE HEAT EXCHANGER FOR COOLING GASES WITH A HIGH BEGINNING TEMPERATURE,
K. K. Bokov. 12 Sep 72, 7p Rept no. FTD-HT-23-722-72
Edited trans. of Patent (USSR) 153 923 p1-2 1963, by Rene E. Courville.

Descriptors: (*Heat exchangers, *Patents), Liquid cooled, Thermal radiation, Configuration, Design, USSR.
Identifiers: Translations, Inventions.

The shell-and-tube heat exchanger for cooling gases with a high beginning temperature is distinguished by the fact that for the purpose of intensifying the cooling of the tube sheet near the side of the hot-gas intake, (which improves its operating conditions), a blind cross baffle (which creates the second cooling circuit) is placed in the intertubular space. The heat exchanger in paragraph 1 is distinguished by the fact that for the purpose of intensifying the heat transfer process through thermal radiation, metal rods of variable cross section are inserted into the tubes from the side of the cooled-gas exhaust. (Author)

PAT-APPL-248471 PC$3.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AIR CONDITIONING SYSTEM AND COMPONENT THEREFOR DISTRIBUTING AIR FLOW FROM OPPOSITE DIRECTIONS.
Patent Application
H. D. Obler, and H. B. Bauer. Filed 28 Apr 72, 23p
NASA-CASE-GSC-11445-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Air conditioning equipment, *Air ducts, *Air flow, *Automatic test equipment, *Flow distribution, Control valves, Patent applications, Ventilation.

An air conditioning system and an automatic air volume control apparatus are presented for distribution of air flow from two opposite directions. The air conditioning system, comprises a plurality of separate air conditioning units coupled to a common supply duct such that air may be introduced into the supply duct in two opposite flow directions. A plurality of outlets, such as registers or auxiliary or branch ducts, communicate with the supply duct. Valve means are located in the supply duct at at least some of the outlets for automatically channelling a controllable amount of air from the supply duct to the associated outlet regardless of the direction of air flow within the supply duct. The control apparatus is composed of: (1) a first air scoop located in the supply duct that deflects air toward an outlet, (2) a second air scoop located in the air duct that deflects air away from the air outlet, and (3) a freely swinging movable vane that channels the air flow with that highest relative pressure into the associated outlet.

Pat-Appl-266866 PC$3.00/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
ELECTROSTATICALLY CONTROLLED HEAT SHUTTER.
Patent Application
L. J. Derr. Filed 28 Jun 72, 11p
NASA-CASE-NPO-11942-1
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Heat transfer, *Thermal conductivity, *Thermal energy, Gas flow, Patent applications.

A heat transfer assembly for conducting thermal energy includes a hermetically sealed container enclosing a quantity of inert gas, such as nitrogen. Two opposed walls of the container have high thermal conducting characteristics, while the connecting walls have low thermal conducting characteristics. Electrodes are positioned adjacent to the highly thermal conducting walls and biased, relative to the conducting walls, to a corona potential for creating an ionic gas wind which must contact the conducting walls to be neutralized. The contact of the gas molecules permits the maximum thermal energy transfer between the walls. Baffles can be positioned adjacent to the electrodes to regulate gas flow between the highly thermal conducting surfaces.

N72-28927 PC$3.00/MF$0.95
Technische Hochschule Munchen (West Germany). Fakultaet Fuer Maschinenwesen Und Elektrotechnik.
ON THE LAYOUT OF HEAVY DUTY GILLED--TUBE RADIATORS . ZUR AUSLEGUNG LEISTUNGSSTARKER RIPPENROHRRADIATOREN.
Ph.D. Thesis,
J. Blumenberg. Oct 71, 20p

Descriptors: *Heat radiators, *Performance prediction, *Space power reactors, Meteoroid hazards, Segments, Structural design, Tube heat exchangers, Weight (mass).

For abstract, see STAR 10 19.

N72-30389 PC$7.75/MF$0.95
Lockheed Missiles and Space Co., Huntsville, Ala. Research and Engineering Center.
FABRICATION, TEST AND DEMONSTRATION OF CRITICAL ENVIRONMENT MONITORING SYSTEM.
Final Report
K. W. Heimendinger. Jun 72, 114p
NASA-CR-123782, LMSC-HREC-D225985
Contract NAS8-27300

Descriptors: *Clean rooms, *Environmental control, *Monitors, *Structural design, Air pollution, Atmospheric moisture, Atmospheric temperature, Automatic control, Performance tests.

For abstract, see STAR 10 21.

N72-30566 PC$3.00/MF$0.95
Istituto Di Fisica Dell Atmosfera, Rome (Italy).
ATMOSPHERIC POLLUTION IN ITALY . LINQUINAMENTO ATMOSFERICO IN ITALIA.
L. Mammarella. Jun 71, 18p IFA-RDP-42
LANG- IN ITALIAN ENGLISH SUMMARY

Descriptors: *Air pollution, *Exhaust gases, *Italy, *Meteorology, Aerosols, Climatology, Combustion products, Cost estimates, Damage, Effluents, Urban transportation.

For abstract, see STAR 10 21.

13B. Civil Engineering

AD-750 309 PC$3.00/MF$0.95
Army Engineer Div North Central Chicago Ill
DYNAMIC RESPONSE OF REINFORCED OPENINGS IN ROCK,
Lewis H. Blakey. 1972, 15p

Descriptors: (*Underground structures, Rock (Geology)), (*Rock (Geology), Loading (Mechanics)), Seismic waves, Orifices, Numerical analysis, Equations of motion, Dynamics.
Identifiers: Finite element analysis, Ground motion.

The purpose of the paper is to report the development of a solution, using the finite element method (FEM), to the problem of the dynamic response of reinforced circular openings in rock subjected to ground motion resulting from nuclear explosions, earthquakes, or other disturbances of the underground environment. (Author)

AD-750 344 PC$3.00/MF$0.95
Army Engineer Explosive Excavation Research Office Livermore Calif
EXPLOSIVE EXCAVATION DEVELOPMENT FOR CONSTRUCTION AND COMBAT APPLICATIONS,
Robert L. LaFrenz, and Walter C. Day. 1972, 15p

Descriptors: (*Cratering, Civil engineering), (*Nuclear explosions, Underground explosions), (*Underground explosions, Cratering), Simulation, Spallation, Seismic waves, Environment.
Identifiers: Nuclear excavation, Ejecta, Ground motion.

Since 1969, research has been directed toward the development of both chemical and nuclear explosive excavation design techniques and engineering procedures which can be used on a wider range of civil engineering excavation projects. Flexibility and adaptability in design procedures, engineering practicability, and cost competitiveness with conventional excavation methods are the guidelines for the current research effort.

AD-750 351 PC$3.00/MF$0.95
Army Natick Labs Mass
DISPOSAL OF CELLULOSIC WASTE MATERIALS BY ENZYMATIC HYDROLYSIS,
Mary Mandels, Lloyd Hontz, and Dixon Brandt. 1972, 16p*

Descriptors: (*Cellulose, *Decomposition), (*Enzymes, Cellulose), Disposal, Wastes (Industrial), Wastes (Sanitary engineering), Glucose, Hydrolysis, Production, Fungi, Cotton, Paper, Wood.
Identifiers: *Biodeterioration, *Waste disposal, *Solid waste disposal, Celluloses, Bagasse, Rice hulls, Agricultural wastes, Trichoderma viride.

The paper summarizes studies on pollution abatement by enzymatic conversion of waste cellulose to useful products. Cellulose is the major component of card board boxes, kraft paper, paper bags, correspondence paper, and newspring, or any other product of wood pulp or cotton. One approach has been the direct conversion of cellulose to animal protein by ruminant feeding, or to single cell protein by growing bacteria or fungi on cellulose. The authors' approach has been a different one. Cellulose was converted to glucose by acid or enzymatic hydrolysis.

AD-750 358 PC$3.00/MF$0.95
Cold Regions Research and Engineering Lab Hanover N H
ICE FORCES ON VERTICAL PILES,
Donald E. Nevel, Roscoe E. Perham, and Gary B. Hogue. 1972, 11p

Descriptors: (*Sea ice, Force (Mechanics)), Piers, Failure (Mechanics), Pressure, Test equipment, Thickness, Test methods, Simulation.
Identifiers: Pile structures.

The force that floating ice sheets can exert on vertical piles is important to the design of both military and civilian structures. Present design codes call for 400 psi as the crushing strength of ice without regard to the influencing factors and their variation. The forces which drive the ice into the structure can be water currents, wind, or thermal expansion. These driving forces may be large enough the cause the ice to fail at or near the surface. The purpose of this research is to define this limiting force level and gain a better understanding of the failure process in the ice. (Author)

AD-750 451 PC$6.00/MF$0.95
Army Coastal Engineering Research Center Washington D C
SHORE PROTECTION, PLANNING AND DESIGN.
Technical rept.
Jun 66, 580p Rept no. CERC-TR-4-Ed-3
See also PB-115 845.

Descriptors: (*Seacoast, Protection), (*Beaches, Erosion), Breakwaters, Sand, Water waves, Wind, Periodic variations, Shallow water, Revetments, Bulkheads, Design.
Identifiers: Sand dunes, Riprap, Littoral transport, *Shore protection, *Beach erosion, *Coastal engineering.

The report is a comprehensive handbook written for engineers concerned with designing coastal structures for shore stabilization or navigation improvement. (Author)

AD-750 453 MF$0.95
California Univ Berkeley
PROCEEDINGS OF THE BERKELEY SYMPOSIUM ON MATHEMATICAL STATISTICS AND PROBABILITY (6TH). HELD AT THE STATISTICAL LABORATORY, UNIVERSITY OF CALIFORNIA ON APRIL 9-12, 1971, JUNE 16-21, 1971 AND JULY 19-22, 1971. VOLUME VI. EFFECTS OF POLLUTION ON HEALTH,
Lucien M. Le Cam, Jerzy Neyman, and Elizabeth L. Scott. 1972, 602p AFOSR-TR-72-1935
Grant AF-AFOSR-1951-70
Library of Congress catalog card no. 49-8189. See also Volume 1, AD-747 457.
Availability: Paper copy available from University of California Press, Berkeley and Los Angeles, Calif. 94720, $22.50.

Descriptors: (*Radiation effects, Public health), (*Air pollution, *Public health), (*Water pollution, Public health), Ecology, Symposia, Radiobiology, Radiation hazards, Neoplasms, Mutations, Herbicides, Toxicity, Population, Statistical analysis, Epidemiology, Nuclear power plants, Infants.
Identifiers: Biomathematics, Environmental surveys, *Air pollution effects (Animals), *Water pollution effects (Animals), X ray fluorescence analysis, Trace elements, Strontium 90, T 2-4-5 herbicide.

Contents:
- Statistical problems and strategies in environmental epidemiology;
- Research programs of the atomic energy commission's division of biology and medicine relevant to problems of health and pollution;
- Statistical aspects of a community health and environmental surveillance system;
- Environmental radiation and human health;
- Epidemiologic studies of carcinogensis by ionizing radiation;
- Radiation and infant mortality--some hazards of methodology;
- Monitoring human birth defects: Methods and strategies;
- Averaging time and maxima for air pollution concentrations;
- Effects of environmental pollutants upon animals other than man;
- Ecological and environmental problems in the application of biomathematics;
- Effects of toxicity on ecosystems;
- Skeletal plan for a comprehensive epidemiologic study of pollution: Effects of exposure on growth and development in children;
- Some skeletal plans for studying health effects of air pollution.

AD-750 552 PC$3.00/MF$0.95
Air Force Weapons Lab Kirtland AFB N Mex
CHEMICAL WASTES GENERATED BY AIR FORCE PHOTOGRAPHIC OPERATIONS.
Technical rept. 1 Nov 71-30 May 72,
Richard E. Lotz. Sep 72, 38p Rept no. AFWL-TR-72-125

Descriptors: (*Photographic chemicals, *Wastes (Industrial)), (*Air Force, Wastes (Industrial)), (*Water pollution, Photographic chemicals), Military facilities, Silver, Cyanides, Iron compounds, Questionnaires, Inventory, Recovery.
Identifiers: Iron cyanides, Materials recovery.

A questionnaire survey of wastes generated by photographic processing was conducted. The questionnaire was sent to all Air Force major command civil engineers and all independent organizations for dissemination. This report includes all the responses received from bases in the CONUS, overseas, and Air National Guard units. Data concerning total rinse water volumes, type of silver recovery, ferricyanide bleach regeneration, and method of disposal have been extracted and compiled. A sample questionnaire and a tabularized presentation of the data are given. Only those categories that serve as a means of outlining the most critical parameters of photographic wastes were selected and compiled.

AD-750 573 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
NAVIGATION CONDITIONS AND FILLING AND EMPTYING SYSTEM, NEW BANKHEAD LOCK, BLACK WARRIER RIVER, ALABAMA: HYDRAULIC MODEL INVESTIGATION.
Final rept. May 68-Nov 70,
Noel R. Oswalt, Jackson H. Ables, Jr., and Thomas E. Murphy. Sep 72, 84p Rept no. AEWES-TR-H-72-6

Descriptors: (*Dams, *Hydraulic models), Rivers, Navigation, Flow fields, Model tests, Photographs, Mechanical drawings, Alabama.
Identifiers: Black Warrior River, *Locks (Waterways).

The hydraulic model investigations reported herein were concerned with planning and design of a new single-lift, 110- by 670-ft lock (pintle to pintle) at the existing Bankhead Lock and Dam on the Black Warrior River in Alabama. Presently, tows negotiate the 69-ft lift at the Bankhead project through a double-lift lock with chamber dimensions of only 52 by 285 ft. Multiple lockages are required for all but the very small tows. Tests were conducted on two models: a 1:100-scale general model which reproduced the river for approximately 1.5 miles upstream and downstream from the dam and included, in addition to the proposed lock, the existing powerhouse, spillway, and lock; and a 1:25-scale model of the filling and emptying system for the new lock. Two basic plans (sites) for the new lock were considered and preliminary tests demonstrated that acceptable navigation conditions could be provided with the lock at either site. (Author)

AD-750 853 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
INVESTIGATION OF SINKING METHODS FOR REMOVAL OF OIL POLLUTION FROM WATER SURFACES. REPORT NO. 3. TESTS AND EVALUATION OF OIL SINKING MATERIALS.
Final rept. on Phases 3 and 4,
Billy J. Houston, Edwin C. Roshore, and Verne D. Edgerton. Apr 72, 148p* USCG-724110.1/1.1
See also report dated Feb 72, AD-741 247.

Descriptors: (*Water pollution, Oils), (*Absorption (Physical), *Oils), Removal, Effectiveness, Test methods, Clay minerals, Talc, Sand, Asbestos, Costs.
Identifiers: *Oil pollution removal, Oil pollution, Fly ash, Absorbents, Barite, Settling.

The purpose of the program was to investigate materials that can be used in the cleanup of massive oil spills by sinking the oil. The program was divided into four phases as follows: Phase I, Survey of the State-of-the-Art (AD-725 617); Phase II, Development of Standard Test Procedures; Phase III, Tests of Sinking Materials; Phase IV, Tests Analysis and Conclusions. The report completes the program as funded and covers the results of Phases III and IV; it also recapitulates pertinent portions of Phases I and II. Twenty-three oil sinking materials, which had been located, were screened and tested. These materials were evalu-

ated (Phase IV) as dry-application sinking agents for oil. Factors such as cost, availability, effectiveness in sinking and tetaining oil, and hazards to personnel and plant life were considered in making the evaluations.

AD-751 822 PC$3.00/MF$0.95
Bureau of Mines Pittsburgh Pa Pittsburgh Mining and Safety Research Center
CONTINUOUS EXPLOSIVE FRAGMENTATION TECHNIQUES.
Annual technical rept.,
Richard Watson, and J. Edmund Hay. 1 May 72, 16p Rept no. PMSRC-P78-2
ARPA Order-1579

Descriptors: (*Underground structures, Construction), (*Explosive materials, Performance (Engineering)), Gels, Explosives initiators, Sensitivity, Hypergolic ignition, Lasers, Explosion effects, Fragmentation.
Identifiers: *Rapid excavation, *Rock mechanics, Tunneling, Slurried explosives.

The study is designed to improve the technology of the application of explosives to rapid excavation, particularly tunneling and mining in hard rock. Primary areas of research include development of jelled or slurry type explosives suitable for automatic injection into boreholes and feasibility studies of initiation systems alternative to conventional electric blasting caps for detomating these explosives. (Author)

COM-72-11383 Reprint
National Air Pollution Control Administration, Cincinnati, Ohio.
A METEOROLOGICAL ANALYSIS OF CARBON DIOXIDE CONCENTRATIONS MEASURED AT A RURAL LOCATION,
John F. Clarke. 8 Dec 68, 10p NOAA-72091637
Revision of report dated 17 May 68.
Pub. in Atmospheric Environment, v3 p375-383 1969.

Descriptors: (*Air pollution, *Carbon dioxide), Rural areas, Sources, Carbon dioxide cycle, Plants (Botany), Combustion products, Seasonal variations, Diurnal variations, Concentration (Composition).

Concentrations of carbon dioxide (CO2) measured at a rural location are presented. The principal contributing source during any specified time period is identified from the nature of the continuous recording trace of concentration. Natural sources dominated the trace pattern during the warmer months. Combustion sources could be identified only in the absence of significant natural sources. It is suggested that emissions of CO2 from natural sources may exert a substantial influence on concentrations of CO2 measured at an urban location during the nocturnal hours of the summer months. CO2 appears to have utility as tracer of urban pollution during the non-growing season. (Author)

EIS-AA-72-5604-D PC$3.00
Department of the Interior, Washington, D.C.
PROPOSED WORLD HERITAGE CONVENTION.
Draft environmental impact statement.
Nov 72, 14p ELR-5604, DES-72-111

Descriptors: (*Environmental surveys, *Ecology), (*Earth (Planet), Environmental surveys), Culture (Social sciences), Education, Social concerns, Humanities, Esthetics, International relations.
Identifiers: Environmental impact statements, *World heritage.

The proposal is for the purpose of ensuring the identification, protection, conservation, and transmission to future generations of natural and cultural heritage throughout the world that is of outstanding universal value. A relatively small number of heritage areas would qualify. For purposes of the convention, international protection of the world's natural and cultural heritage would be understood to mean establishment of a system of international cooperation designed to support efforts of nations ratifying the convention to identify and preserve that heritage.

EIS-AL-72-5542-F PC$4.50/MF$0.95
Federal Highway Administration, Montgomery, Ala. Alabama Div.
PROJECT I-65-2 (32), JEFFERSON COUNTY, BEGINNING AT THE CAHABA RIVER NEAR THE SHELBY-JEFFERSON COUNTY LINE AND EXTENDING NORTHERLY TO THE BEGINNING OF CONSTRUCTION PROJECT I-65-2 (23), JEFFERSON COUNTY, ALABAMA.
Final environmental impact statement.
Oct 72, 47p ELR-5542
Prepared in cooperation with Alabama State Highway Dept.

Descriptors: (*Environmental surveys, *Highways), (*Alabama, Environmental surveys), Improvement, Construction, Traffic engineering, Eminent domain.
Identifiers: *Environmental impact statements, *Jefferson County (Alabama).

The project consists of improvement of Interstate highway 65 in Jefferson County, Alabama, for the purpose of transportation network programs. Environmental effects include the displacement of several families.

EIS-AL-72-5555-F PC$4.00/MF$0.95
Army Engineer District, Mobile, Ala.
DREDGING AND FILLING COWIKEE STATE PARK, LAKEPOINT RESORT, WALTER F. GEORGE LAKE, CHATTAHOOCHEE RIVER, ALABAMA.
Final environmental impact statement.
Oct 72, 36p ELR-5555
Supersedes report dated 1 Jun 72, EIS-AL-72-4604-D.

Descriptors: (*Environmental surveys, Recreational facilities), (*Alabama, Environmental surveys), Lakes, Dredging, Earth fill, Marinas, Parks, Land use.
Identifiers: *Environmental impact statements, Walter F. George Lake, Chattahoochee River, Cowikee State Park.

The proposed project consists of removal of 745,000 cubic yards of material by hydraulic dredge. Material to be removed consists of silty sand, sand and clay, but the greatest portion is poorly graded or gravelly sand. Part of the dredged material will be placed in a low swampy area adjacent to Walter F. George Lake and the remainder will be placed within an area occupied by the summer pool. The filled area will be utilized by the Alabama Department of Natural Resources for construction of Lakepoint Resort. A marina, bathing beach, roads and associated parking facilities will be constructed on the filled area. (Author)

EIS-AL-72-5564-F PC$4.75/MF$0.95
Federal Highway Administration, Montgomery, Ala. Alabama Div.
PROJECT S-6109 (101), TALLADEGA COUNTY, ALABAMA.
Final environmental impact statement.
Oct 72, 55p FHWA-ALA-EIS-71-75-F ELR-5564
Supersedes report dated 29 Nov 71, PB-204 566-D.
Prepared in cooperation with Alabama State Highway Dept.

Descriptors: (*Environmental surveys, *Roads), (*Alabama, Environmental surveyt), Improvement, Rebuilding, Eminent domain, Wildlife, Ecology.
Identifiers: *Environmental impact statements, *Clay County (Alabama), *Talladega County (Alabama), Alabama Route 77.

The statement concerns the construction of a 9.2 mile segment of the reconstruction of State Route 77 being developed between Ashland and Talladega in Clay and Talladega Counties. This is the third section of this route improvement and extends from Porters Gap to Talladega.

EIS-AL-72-5584-D PC$4.50
Federal Highway Administration, Montgomery, Ala. Alabama Div.
PROJECTS I-10-1 (35) AND F-346 (9), MOBILE AND BALDWIN COUNTIES, ALABAMA.
Draft environmental impact statement.
Nov 72, 49p FHWA-ALA-EIS-72-09-D ELR-5584
Prepared in cooperation with Alabama State Highway Dept.

Descriptors: (*Environmental surveys, *Highways), (*Alabama, Environmental surveys), Highway planning, Limited-access highways, Divided highways, Highway improvement, Highway bridges, Interchanges, Tunnels.
Identifiers: *Mobile County (Alabama), *Baldwin County (Alabama), *Environmental impact statements.

The application proposes Project I-10-1 (35), Mobile and Baldwin Counties, beginning at the east end of Project I-10-1 (34), the interchange project at the east end of the I-10 Tunnel under Mobile River and extending easterly and southeasterly across the upper reaches of Mobile Bay, length approximately 7.0 miles. Also Project F-346 (9), Baldwin County, beginning at the east end of the Tensaw River Bridge on U.S. 31 and U.S. 90 and extending southeasterly, connecting with the Project I-10-1 (35) Interchange on Battleship Parkway, length approximately 1.0 mile. The environmental impacts discussed in the statement are: Relocating people and businesses, the area through which the project traverses, the use of a bridge section on Project I-10-1 (35) instead of a conventional roadway section, esthetics, wildlife, air and water pollution, noise, safety, improved traffic conditions and economic effects therefrom, an apparent Section 4 (f) land involvement in Meaher Park and potential pollution if a construction channel is dredged as an aid in construction of the bridge section. (Author)

EIS-AR-72-5579-F PC$30.25/MF$0.95
Environmental Protection Agency, Dallas, Tex. Office of Grants Coordination.
CONSTRUCTION OF WASTEWATER FACILITIES, HOT SPRINGS, ARKANSAS, WPC-AR-K-305.
Final environmental impact statement.
27 Oct 72, 564p Impact Statement-7206 ELR-5579
Supersedes report dated 28 Jul 72, EIS-AR-72-5042-D.

Descriptors: (*Environmental surveys, *Waste water), (*Arkansas, Environmental surveys), Waste treatment, Construction, Improvement, Water treatment, Sewers, Pollution, Outfall sewers.
Identifiers: *Environmental impact statements, Lift stations, Waste water transportation, Hot Springs (Arkansas), Garland County (Arkansas).

The City of Hot Springs, Arkansas proposes to construct a new central waste water treatment facility, sanitary sewer interceptors, outfall lines, and lift stations, and to rehabilitate existing sewers. All of the proposed improvements will be located within or proximate to the city limits of Hot Springs, Garland County. The new treatment facility will be constructed on the shore of Lake Catherine downstream from Carpenter Dam. The new sanitary sewer interceptors will be constructed within the city limits and in the adjacent outlying areas. The existing sewers to be rehabilitated are also within the city limits. (Author)

EIS-AZ-72-5548-D PC$4.75
Bureau of Reclamation, Boulder City, Nev. Region 3.

LOWER MOOVALYA RECREATIONAL DEVELOPMENT, COLORADO RIVER FRONT WORK AND LEVEE SYSTEM, ARIZONA--CALIFORNIA.
Draft environmental impact statement.
Oct 72, 51p ELR-5548, DES-72-108

Descriptors: (*Environmental surveys, *Recreational facilities), (*Arizona, Environmental surveys), California, Dredging, Earth fills, Lakes, Water pollution.
Identifiers: *Environmental impact statements, Colorado River, *Lower Moovalya Recreational Development, Lake Moovalya.

The site is on the Colorado River Indian Reservation about 2 miles northeast of Parker, Arizona. The project consists of dredging about 80 acres of existing marsh into open water to provide space for a kilo race course. The spoil will be used to fill about 83 acres of marsh on the north shore of Lake Moovalya to create dry land suitable for commercial, residential, and recreational development by the Colorado Indian Tribes.

EIS-AZ-72-5552-F PC$5.00/MF$0.95
Federal Highway Administration, Phoenix, Ariz. Arizona Div.
PROJECT F-032-1-301, NOGALES TRUCK COMPOUND ROAD SECTION OF THE NOGALES PRIMARY CONNECTION STATE ROUTE 189, INTERNATIONAL BORDER TO INTERSTATE ROUTE 19, NOGALES, SANTA CRUZ COUNTY, ARIZONA.
Final environmental impact statement.
Nov 72, 57p FHWA-AZ-EIS-72-1F ELR-5552
Supersedes report dated 4 Jan 72, PB-205 345-D.
Prepared in cooperation with Arizona State Highway Dept.

Descriptors: (*Environmental surveys, *Highways), (*Arizona, Environmental surveys), Traffic engineering, Access roads, Construction, Land use, Pollution.
Identifiers: *Environmental impact statements, Arizona Route 189, *Santa Cruz County (Arizona).

The Nogales Truck Compound Road Section of the Nogales Primary Connection (State Route 189), is a new highway on a new location in Santa Cruz County, Arizona. The project corridor begins approximately one mile west of Nogales, Arizona, at the International Border, extends north to a terminus at Interstate and Defense Route 19 and has an approximate length of 2.80 miles.

EIS-AZ-72-5561-F PC$3.00/MF$0.95
Federal Highway Administration, Phoenix, Ariz. Arizona Div.
PROJECTS F-053-2 (9) CLAY SPRINGS SECTION, AND F-053-2 (10), PINEDALE SECTION, PAYSON-SHOW LOW HIGHWAY, STATE HIGHWAY ROUTE 260 IN NAVAJO COUNTY, ARIZONA.
Final environmental impact statement.
5 Jul 72, 13p ELR-5561
Prepared in cooperation with Arizona Highway Dept. Environmental Planning Div. Rept. no. AZHD-EPD-EIS-71-3FS. Supplement to Basic final rept. dated 5 May 72, PB-208 953.

Descriptors: (*Environmental surveys, *Highways), (*Arizona, Environmental surveys), Construction, Alignment, Right of way acquisition, Wildlife, Vegetation.
Identifiers: *Environmental impact statements, Arizona route 260, Navajo County (Arizona).

This addendum to the Final Environmental Impact Statement concerns only Project F-053-2 (9) Clay Springs Section of this proposed project. The project is 5.208 miles in length. The work is comprised of an improvement and shortening of alignment within a 200 foot right of way. Construction will provide a 34 foot, undivided highway with three inch asphaltic concrete surface laid over a base course of varying thickness. The highway will be fenced and have adequate drainage provided by placing culverts and box culverts where required. This addendum covers a two mile line change from that discussed in the original Final Environmental Impact Statement.

EIS-AZ-72-5562-F PC$4.50/MF$0.95
Federal Highway Administration, Phoenix, Ariz. Arizona Div.
FOURTH STREET AND COUNTY AVENUE 2E (YUMA), IN YUMA COUNTY, ARIZONA.
Final environmental impact statement.
Nov 72, 50p FHWA-AZ-EIS-72-7F ELR-5562
Prepared in cooperation with Arizona State Highway Dept. Supersedes report dated 17 Jul 72, EIS-AZ-72-4899-D.

Descriptors: (*Environmental surveys, *Highways), (*Arizona, Environmental surveys), Improvement, Residental buildings, Traffic engineering, Pollution.
Identifiers: *Environmental impact statements, *Yuma County (Arizona), *Yuma (Arizona), US highway 80.

The joint City-County improvement project is located both in the City of Yuma and in Yuma County in southwestern Arizona. The project consists of construction of two 36-foot roadways with asphaltic concrete surfacing, over both new and existing alignment, separated by a 16-foot-wide median. The County project, located between Stations 209 and 284, is approximately 1.43 miles long. The City project, located between Stations 284 and 358, is approximately 1.47 miles long (including the Fourth Street underpass which is a separate project). (Author)

EIS-CA-72-5547-D PC$4.50
Federal Highway Administration, Sacramento, Calif. California Div.
EXPRESSWAY CONSTRUCTION ON ROUTE 395 IN INYO COUNTY, CALIFORNIA, BETWEEN PLEASANT VALLEY DAM ROAD, AND THE MONO COUNTY LINE.
Draft environmental impact statement.
Oct 72, 50p FHWA-CA-EIS-72-04-D ELR-5547
Prepared in cooperation with California State Dept. of Public Works, Div. of Highways.

Descriptors: (*Environmental surveys, *Highways), (*California, Environmental surveys), Construction, Limited access highways, Traffic engineering, Recreational facilities, Esthetics.
Identifiers: *Environmental impact statements, *Inyo County (California), US highway 395.

The project consists of construction of an expressway section on US highway 395 in Inyo County, California, for the purpose of transporation improvement. Environmental effects are minimal.

EIS-CA-72-5597-F PC$21.00/MF$0.95
Department of the Navy, Washington, D.C.
CONSTRUCTION OF NAVY FAMILY HOUSING, LOS ANGELES, CALIFORNIA.
Final environmental impact statement.
Nov 72, 378p ELR-5597
Supersedes report dated Jun 72, EIS-CA-72-4692-D.

Descriptors: (*Environmental surveys, *Residential buildings), (*California, Environmental surveys), Naval personnel, Construction, Surveys, Land use.
Identifiers: *Environmental impact statements, *Los Angeles (California), San Pedro area.

Construction is proposed of 340 units of Navy family housing on two tracts of Department of the Navy land in the San Pedro area of Los Angles, California. The significant differences between this final statement and the draft statement are that the draft statement addressed the construction of 700 units of Navy housing on four tracts of land in the San Pedro and Point Vincente areas. The children in the new housing are expected to exceed the present capacity of the local school system, and there will be some minor loss of open space and views.

EIS-DE-72-5610-D PC$7.75
Federal Highway Administration, Dover, Del. Delaware Div.
RELOCATION OF DELAWARE ROUTE 100, DUPONT ROAD IN THE CITY OF ELSMERE, NEW CASTLE COUNTY, DELAWARE.
Draft environmental impact statement.
Nov 72, 113p FHWA-DE-EIS-72-05-D ELR-5610
Prepared in cooperation with Delaware State Dept. of Highways and Transportation.

Descriptors: (*Environmental surveys, *Highways), (*Delaware, Environmental surveys), Highway planning, Divided highways, Relocation, Bridges.
Identifiers: *Elsmere (Delaware), *Environmental impact statement, Delaware Route 100, Dupont road.

The proposed highway improvement is the reconstruction of DuPont Road which passes through Richardson Park and the Town of Elsmere southwest of the City of Wilmington in New Castle County, Delaware. The project which begins at the intersection of Maryland Avenue (Del. Rt. 4) and DuPont Road (Del. Rt. 100) and ends just north of New Road (Del. Rt. 2), will consist of four lanes and a bridge over Little Mill Creek and the B and O Railroad. The following Environmental Impacts are considered: (1) safety, (2) traffic flow, (3) water pollution, (4) air pollution, (5) noise pollution, (6) community disruption, (7) proposed land use planning, (8) aesthetic values, (9) historic values, (10) pedestrians and bicycles. (Author)

EIS-FL-72-5580-F PC$10.75
Federal Highway Administration, Tallahassee, Fla. Florida Div.
STATE ROAD 516 (U.S. 192), FROM STATE ROAD 5 (U.S. 1), IN MELBOURNE TO STATE ROAD A-1-A, IN INDIALANTIC, BREVARD COUNTY, FLORIDA.
Final environmental impact statement.
Nov 72, 174p FHWA-FLA-EIS-71-52-F ELR-5580
Supersedes report dated 16 Mar 72, PB-207 571-D.
Prepared in cooperation with Florida State Dept. of Transportation.

Descriptors: (*Environmental surveys, *Highways), (*Florida, Environmental surveys), Improvement, Ecology, Trees, Sites.
Identifiers: *Environmental impact statements, *Melbourne (Florida), *Brevard County (Florida), US highway 192.

The project on S.R. 516 in Brevard County, Florida, involves the construction of two additional lanes to the existing causeway. The proposed facility should have little or no social impact of a disruptive nature.

EIS-FL-72-5590-F PC$3.75/MF$0.95
Army Engineer District, Jacksonville, Fla.
BREVARD COUNTY BEACH EROSION CONTROL PROJECT, FLORIDA.
Final environmental impact statement.
May 72, 33p ELR-5590
Supersedes report dated 24 Apr 72, PB-208 552-D.

Descriptors: (*Environmental surveys, *Erosion control), (*Florida, Environmental surveys), Beach nourishment, Rebuilding, Dredging, Benthos, Ecology, Water pollution.
Identifiers: *Environmental impact statements, *Cape Canaveral (Florida), *Indialantic (Florida), *Melbourne Beach (Florida).

The project consists of partial restoration of 2.8 miles of Atlantic Ocean shoreline at the city of

Cape Canaveral and partial restoration and periodic nourishment of 2 miles of shore at the cities of Indialantic and Melbourne Beach. Future nourishment of the Cape Canaveral reach would be accomplished by the authorized sand-transfer plant for Canaveral Harbor. About 988,000 cubic yards of material will be initially dredged from offshore and placed on the beach at Cape Canaveral and approximately 603,000 cubic yards of initial fill placed on the beach at Indialantic and Melbourne. Dredging will temporarily degrade water quality, cause the beach to be temporarily closed for public use, and will destroy most benthic animals in bottom sediments and cover those in the beach nourishment area.

EIS-FL-72-5591-F PC$4.75/MF$0.95
Army Engineer District, Jacksonville, Fla.
BAL HARBOUR, FLORIDA PARTIAL BEACH RESTORATION, BEACH EROSION CONTROL AND HURRICANE PROTECTION PROJECT, DADE COUNTY, FLORIDA.
Final environmental impact statement.
May 72, 55p ELR-5591
Supersedes report dated 21 Apr 72, PB-208 575-D.

Descriptors: (*Environmental surveys, *Shore protection), (*Florida, Environmental surveys), Erosion control, Rebuilding, Hurricanes, Beach erosion, Recreational facilities, Marine biology, Turbidity, Silts, Ecology.
Identifiers: *Environmental impact statements, *Dade County (Florida), Bal Harbor (Florida).

An 0.85-mile reach of the Dade County, Florida, Beach Erosion Control and Hurricane Protection Project will be partially restored at Bal Harbour Beach for a protective and recreational beach. Project fill would be obtained from an ocean borrow pit about 1.5 miles offshore in elevations of -36 to -50 feet. About 1.8 million cubic yards of sand will be dredged from an ocean borrow pit and placed along 0.85 mile of beach for restoration of protective and recreational assets. There will be some temporary turbidity and siltation in the borrow and fill areas during construction. Some marine life will be destroyed; however, these populations are expected to become reestablished.

EIS-GA-72-5550-F PC$12.25/MF$0.95
Directorate of Licensing (AEC), Washington, D.C.
THE EDWIN I. HATCH NUCLEAR PLANT, UNIT 1 AND UNIT 2, GEORGIA POWER COMPANY, DOCKET NOS. 50-321 AND 50-366.
Final environmental impact statement.
Oct 72, 205p ELR-5550
Supersedes report dated 19 Jun 72, EIS-GA-72-4735-D.

Descriptors: (*Environmental surveys, *Nuclear power plants), (*Georgia, Environmental surveys), Boiling water reactors, Water pollution, Radioactive contaminants, Ecology, Rivers, Land use.
Identifiers: *Environmental impact statements, Edwin I. Hatch Nuclear Plant, Appling County (Georgia).

The plant is located on the Altamaha River in the State of Georgia, County of Appling near the town of Baxley. The Hatch plant will consist of two boiling-water reactors, Unit 1 with a maximum anticipated thermal output of 2537 MW (to be licensed for rated power levels up to 2436 MWt, 813 MW gross electric, 786 MW net electric), and Unit 2 with a maximum anticipated thermal output of 2537 MW (rated power levels up to 2436 MWt, 822 MWe gross, 795 MWe net). The units will be cooled by a closed-cycle cooling system using mechanical-draft cooling towers for dissipation of waste heat to the atmosphere.

EIS-GA-72-5551-F PC$8.50/MF$0.95
Federal Highway Administration, Atlanta, Ga. Georgia Div.
GEORGIA PROJECT F-022-1 (4), SPALDING--BUTTS COUNTY, GEORGIA.
Final environmental impact statement.
Nov 72, 126p FHWA-GA-EIS-72-02-F ELR-5551
Supersedes report dated 14 Apr 72, PB-208 643-D. Prepared in cooperation with Georgia State Dept. of Transportation.

Descriptors: (*Environmental surveys, *Highways), (*Georgia, Environmental surveys), Construction, Relocation, Residential buildings, Farms, Grassland, Forest land.
Identifiers: *Environmental impact statements, Spalding County (Georgia), Butts County (Georgia), Georgia route 16.

The project, F-022-1 (4) Spalding-Butts Counties, is a proposed Griffin, Georgia to I-75 connector and relocation of State Route 16. The project will traverse west-east with the western terminus in Griffin, Georgia and the eastern terminus at the interchange of I-75 and State Route 16 in Butts County. Environmental impacts are discussed.

EIS-GA-72-5570-D PC$5.75
Federal Highway Administration, Atlanta, Ga. Georgia Div.
GEORGIA PROJECTS U-009-2 (21), AND F-041-2 (15), CHATHAM COUNTY.
Draft environmental impact statement.
Nov 72, 71p FHWA-GA-EIS-72-07-D ELR-5570
Prepared in cooperation with Georgia State Dept. of Transportation.

Descriptors: (*Environmental surveys, *Highways), (*Georgia, Environmental surveys), Construction, Right of way acquisition, Traffic engineering, Eminent domain.
Identifiers: *Environmental impact statements, Chatham County (Georgia), Georgia highway 21, US highway 80.

The project consists of construction of a free access highway facility in Chatham County, Georgia, for the purpose of transportation improvement. Environmental effects will be generally beneficial, although about ten families and eleven businesses will be displaced.

EIS-GA-72-5577-D PC$3.75
Army Engineer District, Mobile, Ala.
CARTERS DAM AND LAKE, COOSAWATTEE RIVER, GEORGIA.
Draft environmental impact statement.
Oct 72, 35p ELR-5577

Descriptors: (*Environmental surveys, *Multiple purpose reservoirs), (*Georgia, Environmental surveys), Flood control, Construction, Hydroelectric power production, Recreational facilities, Land use.
Identifiers: Land inundation, *Environmental impact statements, *Murray County (Georgia), *Gilmer County (Georgia), *Gordon County (Georgia), Coosawattee River.

It is proposed to complete construction and place in operation an authorized multipurpose reservoir project on the Coosawattee River in Murray, Gilmer and Gordon Counties, Georgia. The project is being constructed for the purposes of flood control, hydroelectric power and recreation. Environmental impacts include the conversion of 4,250 acres of agricultural and forest lands to a lake environment; loss of free-flowing stream habitat; and production of peaking power hydroelectric power.

EIS-ID-72-5556-D PC$5.25
Intermountain Forest and Range Experiment Station, Ogden, Utah.
HERBICIDE CONTROL OF SAGEBRUSH AND WYETHIA IN IDAHO.
Draft environmental impact statement.
27 Oct 72, 65p ELR-5556, USDA-FS-DES (Adm)-73-29

Descriptors: (*Environmental surveys, *Herbicides), (*Idaho, Environmental surveys), Chlorine aromatic compounds, Spraying, Vegetation.
Identifiers: *Environmental impact statements, D 2-4 herbicide, Acetic acid/2-4-dichlorophenoxy, Sagebrush, Wyethis, Salmon River.

The statement applies to national forest and national grassland areas administered by the Intermountain Region of the U.S. Forest Service, U.S. Department of Agruculture, in that part of southern Idaho lying south of the Salmon River. It covers the practice of applying the herbicide 2,4-dichlorophen-oxyacetic acid (2,4-D) to approximately 15,000 acres each year of land covered by dense stands of sagebrush and wyethis. Environmental impacts are discussed.

EIS-IL-72-5544-D PC$5.00
Federal Highway Administration, Springfield, Ill. Illinois Div.
FAP 411, FROM NORTH OF LAWRENCEVILLE TO HARRISBURG, ILLINOIS.
Draft environmental impact statement.
17 Oct 72, 60p FHWA-ILL-EIS-72-40-D ELR-5544
Prepared in cooperation with Illinois State Dept. of Transportation.

Descriptors: (*Environmental surveys, *Highways), (*Illinois, Environmental surveys), Freeways, Construction, Traffic safety, Traffic engineering, Right of way acquisition.
Identifiers: *Environmental impact statements.

The project consists of 95 miles of improvements to Illinois highway 1 in six counties of southeastern Illinois for the purpose of traffic betterment. Environmental effects include economic and social benefits, and the taking of required land for right of way.

EIS-IL-72-5576-D PC$4.00
Federal Highway Administration, Springfield, Ill. Illinois Div.
FAU ROUTE 8825, SECTION 211-B-C.S.
Draft environmental impact statement.
Nov 72, 37p FHWA-ILL-EIS-72-39-D ELR-5576
Prepared in cooperation with City of Rockford, Dept. of Public Works, Illinois.

Descriptors: (*Environmental surveys, *Highways), (*Illinois, Environmental surveys), Construction, Improvement, Right of way acquisition, Land use.
Identifiers: *Environmental impact statements, Winnebago County (Illinois).

Project consists of the construction of 0.455 miles of FAU Route 8825 to provide a four-lane facility extending easterly from South Main Street (Illinois Route 2) in Winnebago County, Illinois across the Rock River to Falund Street in the City of Rockford. Environmental impacts are given.

EIS-IL-72-5583-F PC$5.25/MF$0.95
Federal Aviation Administration, Washington, D.C. Airports Service.
EDGAR COUNTY AIRPORT, PARIS, ILLINOIS.
Final environmental impact statement.
Nov 72, 64p ELR-5583
Supersedes report dated 7 Apr 72, PB-208 042-D.

Descriptors: (*Environmental surveys, *Airports), (*Illinois, Environmental surveys), Construction, Landing fields, Land use.
Identifiers: *Environmental impact statements, *Edgar County Airport, Paris (Illinois).

The purpose of the project is to provide a safe and adequate landing facility for the Edgar County area. At present, there are only two landing facilities in the Paris/Edgar County area. Both airports are privately owned and operated, have no hard surfacing and are not adequately lighted for itinerant night operations. The proposed site selected is in an area of open farm land. The

proposed runway location and orientation was established to provide good wind coverage. The proposed airport will be located in the East 1/2 of Section 6 and the West 1/2 of Section 5 of Edgar Township, Range 11 W, Township 14 N, West of the 2nd P.M., Edgar County, Illinois, Latitude 39 degrees 42 minutes N, Longitude 87 degrees 40 minutes W. This location is approximately 6.5 miles north-northeast of the City of Paris (pop. 10,061). The impacts of the improvement are discussed.

EIS-LA-72-5543-D PC$4.50
Army Engineer District, New Orleans, La.
MORGAN CITY, LOUISIANA, AND VICINITY (FRANKLIN AND VICINITY AREA), LOUISIANA.
Draft environmental impact statement.
20 Sep 72, 46p ELR-5543

Descriptors: (*Environmental surveys, *Flood control), (*Louisiana, Environmental surveys), Hurricanes, Protection, Storm surges, Levees, Construction, Retaining walls, Drainage.
Identifiers: *Environmental impact statements, Navigation gates, Lower Atchafalaya River, *Saint Mary Parish (Louisiana).

The project consists of construction of flood control structures in St. Mary Parish, Louisiana, for the purpose of minimizing hurricane tidal water damage. Environmental effects are expected to be beneficial.

EIS-LA-72-5549-D PC$12.25
Directorate of License (AEC), Washington, D.C.
THE PROPOSED CONSTRUCTION OF THE WATERFORD STEAM ELECTRIC STATION UNIT 3 BY LOUISIANA POWER AND LIGHT COMPANY, DOCKET NUMBER 50-382.
Draft environmental impact statement.
Oct 72, 201p ELR-5549

Descriptors: (*Environmental surveys, *Nuclear power plants), (*Louisiana, Environmental surveys), Water pollution, Site surveys, Ecology, Radioactive contamination, Cost analysis, Pressurized water reactors.
Identifiers: *Environmental impact statements, St. Charles Parish (Louisiana).

The Site is on the Mississippi River in the State of Louisiana about 25 miles NW of New Orleans and near the town of Taft, St. Charles Parish. Unit No. 3 will employ a pressurized water reactor to produce 3410 megawatts thermal (MWt). A steam turbine-generator will use this heat to provide 1165 MW (net) of electrical power capacity. A stretch power level of 3560 MWt is anticipated at a future date and is considered in the assessments contained in this statement. The exhaust steam will be cooled by once-through flow of water obtained from and discharged to the Mississippi River.

EIS-LA-72-5558-D PC$5.00
Army Engineer District, New Orleans, La.
MISSISSIPPI RIVER-GULF OUTLET, MICHOUD CANAL, LOUISIANA.
Draft environmental impact statement.
13 Oct 72, 57p ELR-5558

Descriptors: (*Environmental surveys, *Navigable canals), (*Louisiana, Environmental surveys), Spoil, Swamps, Dredging.
Identifiers: *Environmental impact statements.

The project concerns the construction of a ship channel to elevation-36 feet m.l.g. (mean low gulf) over a bottom width of 250 feet and an 800- by 800-foot turning basin at the northern terminus of the existing Michoud Canal. Also considered is the enlargement about 1 mile of existing channel of the Gulf Intracoastal Waterway (GIWW) between the Mississippi River-Gulf Outlet (MR-GO) and all of the approximately 1.5 miles of the Michoud Canal essentially within the existing banks. (Author)

EIS-LA-72-5585-F PC$3.25/MF$0.95
Army Engineer District, Vicksburg, Miss.
MONROE FLOODWALL, LOUISIANA.
Final environmental impact statement.
3 Aug 72, 21p ELR-5585
Supersedes report dated 12 Apr 72, PB-208 374-D.

Descriptors: (*Environmental surveys, *Flood control), (*Louisiana, Environmental surveys), Retaining walls, Closures, Construction.
Identifiers: *Environmental impact statements, *Monroe (Louisiana), Floodwalls.

Closure of the 1,750-foot gap in the existing flood protection facilities at Monroe, Louisiana, is proposed by means of a folding wall structure. Environmental impacts are discussed.

EIS-LA-72-5588-F PC$4.75/MF$0.95
Army Engineer District, New Orleans, La.
CHOCTAW BAYOU AND TRIBUTARIES, LOUISIANA.
Final environmental impact statement.
26 Jun 72, 54p ELR-5588
Prepared in cooperation with Associated Water Features Choctaw Bayou and Bayou Chalpin, Cholpe, Sterling, and Chamberlin Canal, Louisiana. Supersedes report dated 29 Apr 72, PB-198 843-D.

Descriptors: (*Environmental surveys, *Flood control), (*Louisiana, Environmental surveys), Clearing, Channel improvement, Wildlife, Fishes, Land development, Sedimentation.
Identifiers: *Environmental impact statements, *Choctaw Bayou.

The report describes the proposal to initiate construction, in fiscal year 1973, to provide an improved drainage outlet for the project area by increasing the floodwater-carrying capacities of Choctaw Bayou and tributaries by enlargement and/or clearing and snagging of the channels. The project is located in Pointe Coupee and West Baton Rouge Parishes, Louisiana. Environmental impacts are discussed.

EIS-LA-72-5608-F PC$7.00/MF$0.95
Federal Highway Administration, Baton Rouge, La. Louisiana Div.
STATE PROJECT NO. 700-06-82, FEDERAL AID SECONDARY PROJECT LAFITTE-LAROSE HIGHWAY, JEFFERSON AND LAFOURCHE PARISHES, LOUISIANA.
Final environmental impact statement.
Nov 72, 96p FHWA-LA-EIS-71-11-F ELR-5608
Prepared in cooperation with Louisiana State Dept. of Highways. Supersedes report dated 28 May 71, PB-199 591-D.

Descriptors: (*Environmental surveys, *Roads), (*Louisiana, Environmental surveys), Traffic engineering, Traffic safety, Land use, Air pollution.
Identifiers: *Environmental impact statements, *Jefferson Parish (Louisiana), *Lafourche Parish (Louisiana).

The proposed project consists of an ultimate 4-lane, full access, land service, rural-type facility with fixed high-level bridges at Bayou Perot, Bayou Barataria at Barataria north of the present Kerner Bridge, and Bayou Barataria approximately 0.65 mile east of the Wagner Ferry Bridge. Because of the tremendous cost of a project of this undertaking, the Department proposes to construct this project in stages. The first stage will provide a 2-lane, 2-way facility and the final stages will provide the ultimate 4-lane, divided facility. The project will initially be designed for the ultimate 4-lane facility and all rights of way acquired. The entire route will be built on new location. Adverse and beneficial impacts are discussed.

EIS-MA-72-5546-D PC$6.00
Federal Highway Administration, Boston, Mass. Massachusetts Div.
MASSACHUSETTS ROUTE 52 EXPRESSWAY, FEDERAL AID HIGHWAY PROJECT WORCESTER AND WEST BOYLSTON, MASSACHUSETTS.
Draft environmental impact statement.
Sep 72, 79p FHWA-MASS-EIS-72-31-D ELR-5546
Supplement to PB-200 383-D.

Descriptors: (*Environmental surveys, *Highways), (*Massachusetts, Environmental surveys), Limited access highways, Traffic engineering, Construction, Eminent domain, Economic development.
Identifiers: *Environmental impact statements, *Worcester (Massachusetts), *Indian Lake (Massachusetts), Massachusetts route 52.

The following topics are discussed: Description of the proposed Massachusetts Route 52 expressway and its proposed environs in northern Worcester, Massachusetts; Alternatives; Environmental impact; Assessment of environmental impacts.

EIS-ME-72-5592-D PC$3.75
Federal Aviation Administration, Washington, D.C. Airports Service.
EXTEND, WIDEN, MARK AND LIGHT RUNWAY, CONSTRUCT PARALLEL TAXIWAY AND APRON, BIDDEFORD MUNICIPAL AIRPORT, BIDDEFORD, MAINE.
Draft environmental impact statement.
Oct 72, 33p ELR-5592

Descriptors: (*Environmental surveys, *Airports), (*Maine, Environmental surveys), Construction, Runways, Taxiways, Lighting equipment, Engine noise, Land acquisition.
Identifiers: *Environmental impact statements, Biddeford Municipal Airport, Biddeford (Maine).

The proposed project contemplates the acquisition of certain parcels of land, the widening, strengthening, lighting and extension of Runway 6-24; construction of a parallel taxiway, airport access road; installation of security fencing, VASI-2 and approach clearing and/or obstruction lighting. Environmental impacts are discussed.

EIS-MI-72-5563-F PC$6.00/MF$0.95
Federal Highway Administration, Lansing, Mich. Michigan Div.
PROPOSED REPLACEMENT OF THE PORTAGE RIVER BRIDGE AND APPROACHES, HIGHWAY M-106, JACKSON COUNTY, MICHIGAN.
Final environmental impact statement.
Nov 72, 79p FHWA-MICH-EIS-71-12-F ELR-5563
Supersedes report dated 9 Sep 71, PB-202 591-D.
Prepared in cooperation with Michigan State Dept. of Highways.

Descriptors: (*Environmental surveys, *Highway bridges), (*Michigan, Environmental surveys), Bridge approaches, Replacing, Traffic safety, Land use, Hydrology.
Identifiers: *Environmental impact statements, *Jackson County (Michigan), Michigan Route 106.

The report concerns the replacement of the M-106 Bridge over the Portage River and reconstruction of the highway approaches to that bridge; Jackson County, Michigan. Additionally, two county road intersections with M-106 are to be reconstructed providing improved angles of intersection, with minor short relocations to improve intersection safety. (Author)

EIS-MN-72-5540-D PC$4.75
Federal Highway Administration, St. Paul, Minn. Minnesota Div.
TRUNK HIGHWAY 169 IN ST. LOUIS COUNTY, MINNESOTA, STATE PROJECT 6935-39, MINNESOTA PROJECT F 076-2 ( ), FROM WEST LIMITS OF THE CITY OF CHISHOLM,

TO COUNTY STATE AID HIGHWAY 25, NEAR THE VILLAGE OF KINNEY, MINNESOTA.
Draft environmental impact statement.
Oct 72, 52p FHWA-MN-EIS-72-12-D ELR-5540
Prepared in cooperation with Minnesota State Dept. of Highways.

Descriptors: (*Environmental surveys, *Highways), (*Minnesota, Environmental surveys), Construction, Site surveys, Traffic engineering, Eminent domain.
Identifiers: *Environmental impact statements, *Saint Louis County (Minnesota), Minnesota highway 169.

The project consists of construction of an expressway in St. Louis County, Minnesota, for the purpose of area economic development. Environmental effects are minimal.

EIS-MN-72-5598-F PC$3.25/MF$0.95
Federal Aviation Administration, Washington, D.C. Airports Service.
WARROAD MUNICIPAL AIRPORT, ROSEAU COUNTY, MINNESOTA.
Final environmental impact statement.
Nov 72, 25p ELR-5598
Supersedes report dated 7 Apr 72, PB-208 185-D.

Descriptors: (*Environmental surveys, *Airports), (*Minnesota, Environmental surveys), Construction, Runways, Taxiways, Aprons, Lighting equipment, Access roads.
Identifiers: *Environmental impact statements, *Warroad (Minnesota).

The Village of Warroad, Roseau County, Minnesota, has submitted a request for Federal financial assistance for futher development of the Warroad Municipal Airport, under the Airport Development Aid Program, as authorized by the Airport and Airway Development Act of 1970, including surfacing a 75' x 3500' NW/SE runway, constructing a 635' x 40' connecting taxiway, a 200' x 400' apron, safety fencing, lighting and entrance road. Acquiring this property and developing the runway will provide aerial accessibility to the community during periods of wet and inclement weather and during the hours of darkness. In addition, a greater margin of public safety than is now experienced with the present unlighted grass runway will be realized. The existing turf runway is only 2,300' long. The turf runway is difficult to maintain as a safe facility for general aviation aircraft, especially during the spring thaw and other periods of inclement weather. In order to provide an adequate facility for the existing and probable future general aviation needs of this area, it is necessary to lengthen and pave this runway as proposed.

EIS-MT-72-5574-F PC$24.75/MF$0.95
Federal Highway Administration, Helena, Mont. Montana Div.
PROJECT F-20 (1), U.S. 191, SPUR. MOUTH OF THE WEST FORK OF THE WEST GALLATIN RIVER, MONTANA.
Final environmental impact statement.
Nov 72, 454p ELR-5574
Supersedes report dated 29 Feb 72, PB-207 060-D.
Prepared in cooperation with Montana State Dept. of Highways.

Descriptors: (*Environmental surveys, *Highways), (*Montana, Environmental surveys), Improvement, Land use, Air pollution, Water pollution, Recreational facilities.
Identifiers: *Environmental impact statements, US highway 191, Gallatin County (Montana), Madison County (Montana).

The project begins on U.S. 191 near the mouth of the West Fork of the West Gallatin River about midway between Bozeman and West Yellowstone, Montana. It extends up the West Fork drainage a distance of 9.7 plus or minus miles, to a point near the base of Lone Moutain and very near the divide between the Gallatin and Madison Rivers. The project is a federal-aid primary spur to federal-aid Primary Route 50. It is located in Gallatin and Madison Counties. (Author)

EIS-NB-72-5541-F PC$3.75/MF$0.95
Federal Highway Administration, Lincoln, Nebr. Nebraska Div.
PROJECT U-151 (1), INTERSECTION IMPROVEMENTS FOR A SEGMENT OF U.S. 6 (CITY ROUTE), AT THE NORTHEAST JUNCTION OF 70TH STREET AND COTNER BOULEVARD, IN LINCOLN, LANCASTER COUNTY, NEBRASKA.
Final environmental impact statement.
Oct 72, 34p FHWA-NEB-EIS-72-10-F ELR-5541
Prepared in cooperation with Nebraska Dept. of Roads.

Descriptors: (*Environmental surveys, *Highways), (*Nebraska, Environmental surveys), Intersections, Relocation, Residential buildings, Trees (Plants).
Identifiers: *Environmental impact statements, US route 6, Lancaster County (Nebraska).

The improvement, Project U-151 (1), consists of the relocation and redesign of the existing Y intersection at the junction of 70th Street and Cotner Boulevard. The improvement will include new four-lane median divided, high type pavement with channelizing islands and left-turn storage lanes at selected intersections, realignment, reconnection and/or closing of adjacent local streets, grading, new storm sewers and inlets, street lighting and roadside improvement. A summary of environmental impacts is given.

EIS-NB-72-5567-D PC$3.95
Bureau of Sport Fisheries and Wildlife, Washington, D.C.
PROPOSED CRESCENT LAKE WILDERNESS AREA, NEBRASKA.
Draft environmental impact statement.
31 Oct 72, 32p ELR-5567, DES-72-110

Descriptors: (*Environmental surveys, *National parks), (*Nebraska, Environmental surveys), Conservation, Birds, Ecology, Project planning, Wildlife, Land use.
Identifiers: *Environmental impact statements, Crescent Lake national wildlife refuge, Garden County (Nebraska), *Wilderness areas.

The project consists of designation of 24,000 acres of the Crescent Lake national wildlife refuge in Garden County, Nebraska, as wilderness area for the purpose of waterfowl flyway and breeding habitat protection. Environmental effects are natural environment conservation, restrictions on motorized travel, and prohibition of commercial utilization of natural resources.

EIS-NB-72-5593-F PC$4.00/MF$0.95
Federal Aviation Administration, Washington, D.C. Airports Service.
ADAP PROJECT, SEWARD MUNICIPAL AIRPORT, SEWARD, NEBRASKA.
Final environmental impact statement.
Nov 72, 36p ELR-5593
Supersedes report dated 14 Aug 72, EIS-NB-72-5191-D.

Descriptors: (*Environmental surveys, *Airports), (*Nebraska, Environmental surveys), Improvement, Construction, Land acquisition, Runways, Taxiways, Aircraft noise.
Identifiers: *Environmental impact statements, *Seward (Nebraska), Seward Municipal Airport.

The City of Seward, Seward County, Nebraska, has requested Federal financial assistance for a project to acquire land and develop an airport facility. The proposed development is necessary to provide a safe and efficient facility to serve the community. The proposed site is located 2.5 miles south of Seward. The area around the airport will be zoned by a joint City-County Zoning Regulation for a radius of three miles. Adverse and beneficial environmental effects are discussed.

EIS-NB-72-5596-D PC$10.25
Directorate of Licensing (AEC), Washington, D.C.
PROPOSED ISSUANCE OF AN OPERATING LICENSE TO NEBRASKA PUBLIC POWER DISTRICT FOR THE COOPER NUCLEAR STATION, DOCKET NO. 50-298.
Draft environmental impact statement.
Nov 72, 162p ELR-5596

Descriptors: (*Environmental surveys, *Nuclear electric power generation), (*Nebraska, Environmental surveys), Thermonuclear power generation, Nuclear engineering, Nuclear reactors, Safety engineering, Effluents, Monitors.
Identifiers: *Environmental impact statements, *Cooper nuclear station, *Nemaha County (Nebraska).

This statement is submitted in relation to the continuation of construction permit CPPR-42 and the proposed issuance of an operating license to the Nebraska Public Power District for the startup and operation of Cooper Nuclear Station, a nuclear power reactor located on the Missouri River near the town of Brownville in Nemaha County, Nebraska (Docket No. 50-298). The station will employ a boiling water reactor to produce up to 2381 megawatts thermal (MWt). A steam turbine-generator will use this heat source to provide 778 MW (net) of electrical power capacity. A final power level of 2486 MWt (813 MWe) is anticipated at a future date and is considered in the radiological assessments contained in this statement. The exhaust steam will be cooled by once-through flow of water obtained from and discharged to the Missouri River. Statement contains a summary of environmental impact and adverse effects.

EIS-NC-72-5566-F PC$7.00/MF$0.95
Federal Highway Administration, Raleigh, N.C North Carolina Div.
PROPOSED RELOCATED US64 BETWEEN NC 231 AND THE NASHVILLE BYPASS, NASH COUNTY, NORTH CAROLINA. STATE PROJECT 6.301749 (FORMERLY PROJECT 8.11587), FAP 36-1 ( ).
Final environmental impact statement.
Nov 72, 97p FHWA-NC-EIS-72-71-07-F ELR-5566
Supersedes report dated 28 Feb 72, PB-207 076-D.
Prepared in cooperation with North Carolina State Highway Commission.

Descriptors: (*Environmental surveys, *Highways), (*North Carolina, Environmental surveys), Land use, Construction, Relocation, Forest land, Farms.
Identifiers: *Environmental impact statements, Nash County (North Carolina).

The project consists of relocation of US highway 64 in Nash County, North Carolina, for the purpose of providing a freeway facility. Environmental effects include right of way acquisition, and the displacement of a few families.

EIS-NC-72-5572-D PC$3.75
Federal Aviation Administration, Washington, D.C. Airports Service.
JACKSON COUNTY AIRPORT, SYLVA, NORTH CAROLINA.
Draft environmental impact statement.
Oct 72, 32p ELR-5572

Descriptors: (*Environmental surveys, *Airports), (*North Carolina, Environmental surveys), Construction, Aircraft noise, Clearing.
Identifiers: *Environmental impact statements, *Sylva (North Carolina), *Jackson County (North Carolina).

The project consists of new airport construction at Sylva, North Carolina, in Jackson County for the purpose of accommodating propeller aircraft. Environmental effects include tree clearing and slightly increased aircraft noise.

EIS-NC-72-5589-D PC$3.50
Federal Highway Administration, Raleigh, N.C. North Carolina Div.
NC 268, ELKIN BYPASS, SURRY-YADKIN-WILKES COUNTIES, PROJECT 6.801855, NORTH CAROLINA.
Draft environmental impact statement.
Nov 72, 28p FHWA-NC-EIS-72-17-D ELR-5589
Prepared in cooperation with North Carolina State Highway Commission.

Descriptors: (*Environmental surveys, *Highways), (*North Carolina, Environmental surveys), Highway planning, Construction, Divided highways, Residential buildings, Vehicle traffic control.
Identifiers: Environmental impact statements, *Surry county (North Carolina), *State highway 268, Yadkin County (North Carolina), Wilkes County (North Carolina).

The N.C. State Highway Commission proposes to construct a NC 268 Bypass of Elkin, with a connector to NC 67, in Surry, Yadkin, and Wilkes Counties. The proposed action will have an overall positive impact on the area by fulfilling an essential element of the thoroughfare plans for Elkin and the area counties, by providing for faster, safer, and more efficient passage of traffic to and around the central business, residential, and industrial areas of Elkin, and by affording general economic and social enhancement of the area. Adverse effects of the project will be acquisition of approximately 300 acres of rural land for right of way; displacement of approximately 35 residences (including a church parsonage), 5 businesses, a State Highway Patrol station, and possibly a church; increased traffic noise and air pollution to residents along a new road; short-term siltation of Yadkin River, Elkin River, and Elkin Reservoir, which are sources of water supply; and increases in noise and air pollution to nearby residents due to construction activities, and loss of medium quality wildlife habitat. The bypass project follows a corridor that has long been established through years of planning studies. No other feasible alternative corridor is available.

EIS-ND-72-5606-F PC$4.50/MF$0.95
Federal Highway Administration, Bismarck, N.D. North Dakota Div.
PROJECT F-6-002 (05)910, 5TH STREET NORTH IMPROVEMENT IN GRAND FORKS, GRAND FORKS COUNTY, NORTH DAKOTA.
Final environmental impact statement.
Nov 72, 46p FHWA-ND-EIS-72-03-F ELR-5606
Prepared in cooperation with North Dakota State Highway Dept.

Descriptors: (*Environmental surveys, *Streets), (*North Dakota, Environmental surveys), Construction, Improvement, Land use, Parks.
Identifiers: *Environmental impact statements, Grand Forks (North Dakota).

The proposed project is located on 5th Street North which is part of the business loop for U.S. Highway No. 2. The project would begin at the intersection of 5th Street North Gateway Drive and end at the intersection of 5th Street North and University Avenue. The length of the improvement is approximately 9 blocks. The project will now consist of widening and resurfacing the present street. No new right of way will be needed. Environmental impacts are discussed.

EIS-NJ-72-5539-D PC$4.50
Federal Highway Administration, Trenton, N.J. New Jersey Div.
ROUTE U.S. 206 FREEWAY (HAMMONTON BYPASS), FROM THE WHARTON STATE FOREST TO ROUTE 54 AND THE ATLANTIC CITY EXPRESSWAY IN THE TOWN OF HAMMONTON, ATLANTIC CITY, NEW JERSEY.
Draft environmental impact statement.
Oct 72, 48p FHWA-NJ-EIS-72-06-D ELR-5539
Prepared in cooperation with New Jersey State Dept. of Transportation.

Descriptors: (*Environmental surveys, *Freeways), (*New Jersey, Environmental surveys), Bypasses, Construction, Improvement, Right of way acquisition.
Identifiers: *Environmental impact statements, US route 206, Atlantic County (New Jersey).

The section of Route U. S. 206 Freeway (Hammonton Bypass) is proposed as a four-lane limited access facility running from the Wharton State Forest to Route 54 and the Atlantic City Expressway. The entire project is within the town of Hammonton in Atlantic County. This facility is required to bypass the business and residential sections and thereby eliminate many of the social, economic and environmental problems associated with the existing Route 54. The various alternatives vary from 5.3 to 7.6 miles in length. A summary of environmental impacts is given.

EIS-NJ-72-5557-D PC$11.50
Directorate of Licensing (AEC), Washington, D.C.
THE SALEM NUCLEAR GENERATING STATION UNITS 1 AND 2, PUBLIC SERVICE ELECTRIC AND GAS COMPANY, DOCKET NUMBERS 50-272, 50-311.
Draft environmental impact statement.
Oct 72, 190p ELR-5557

Descriptors: (*Environmental surveys, *Nuclear power plants), (*New Jersey, Environmental surveys), Nuclear power generation, Pressurized water reactors, Ecology, Radiological contamination, Water pollution.
Identifiers: Salem Nuclear Generating Station, *Environmental impact statements, Delaware River.

The Salem Nuclear Generating Station Units 1 and 2 will employ identical pressurized water reactors to produce rated outputs of 3350 and 3423 thermal megawatts (MWt), respectively. The equivalent warranted gross and approximate net electrical output of the units will be 1090 and 1115 electrical megawatts (MWe), respectively. The turbine-generator exhaust steam will be cooled by once-through flow of brackish water obtained from and discharged to the Delaware River. (Author)

EIS-NJ-72-5587-F PC$3.75/MF$0.95
Army Engineer District, New York.
SOUTH BRANCH, RAHWAY RIVER, NEW JERSEY, FLOOD CONTROL PROJECT, RAHWAY, NEW JERSEY.
Final environmental impact statement.
May 72, 31p ELR-5587
Supersedes report dated 3 Jan 72, PB-205 339-D.

Descriptors: (*Environmental surveys, *Channel improvements), (*New Jersey, Environmental surveys), (*Flood control, Environmental surveys), Rivers, Levees, Earth fills, Drainage, Bridges, Urban areas.
Identifiers: *Environmental impact statements, *Rahway (New Jersey), *Rahway River.

This project consists of the construction of local flood protection in Rahway, New Jersey on the South Branch of the Rahway River. The plan consists of channel improvement, levees, floodwalls, land filling, a roadway bridge, interior drainage facilities, including a pump station and beautification features. A reduction of flood damage threat is anticipated for a residential area that is presently planned as the site for an urban renewal project. The impacts of the improvement are discussed.

EIS-NJ-72-5602-D PC$3.00
Bureau of Outdoor Recreation, Philadelphia, Pa. Northeast Regional Office.
PROPOSED ALLAMUCHY MOUNTAIN STATE PARK LAND ACQUISITION, LAND AND WATER CONSERVATION FUND PROJECT NO. 34-00191, STATE OF NEW JERSEY.
Draft environmental impact statement.
Nov 72, 19p ELR-5602, DES-72-112

Descriptors: (*Environmental surveys, *Recreational facilities), (*New Jersey, Environmental surveys), Parks, Public land, Land development, Skiing, Land acquisition.
Identifiers: *Environmental impact statements, *Sussex County (New Jersey), Allamuchy Mountain State Park, *Warren County (New Jersey).

The State of New Jersey, Department of Environmental Protection requests assistance from the Federal Land and Water Conservation Fund for the purchase, in fee simple, of 3,604.6 acres of land to be added to present holdings of approximately 8,000 acres at Allamuchy Mountain State Park. The proposed acquisition, located in Sussex and Warren Counties in northwest New Jersey, will serve the recreational needs of New Jersey and the metropolitan New York area. The proposed acquisition will have minor impact on the environment. Both localized environmental values and the effect on the macro-environment will be minimal. Over 2,800 acres of the 3,600-acre acquisition will be left in its natural state for low intensity recreational use. The only proposed facility having minor environmental impact on the site would be a ski area to be developed at a later date. The economic and social impact of the acquisition will be offset by in-lieu tax payments from the State, economic spinoff as a result of park development, increased tax ratables, and new employment opportunities.

EIS-NM-72-5603-D PC$4.25
National Park Service, Santa Fe, N. Mex. Southwest Region.
ROADS AND UTILITIES, WILLOW CREEK RECREATION SITE, HERON RESERVOIR, NEW MEXICO.
Draft environmental impact statement.
Nov 72, 41p ELR-5603, DES-72-113

Descriptors: (*Environmental surveys, *Recreational facilities), (*New Mexico, Environmental surveys), Access roads, Underground facilities, Parking facilities, Reservoirs (Lakes), Marinas, Water supply, Sewage disposal, National Parks.
Identifiers: *Heron Reservoir (New Mexico), *Willow Creek recreation site, Environmental impact statements.

It is proposed to construct roads, parking areas, underground utilities, a well and sewage lagoon at Willow Creek Recreation Site, Rio Arriba County, New Mexico. A minor amount of natural vegetation will be destroyed by the construction. The proposal will increase visitation, which, in turn, will have an effect on the economy of the area. The incomplete development may cause adverse impacts on the natural environment.

EIS-NV-72-5614-D PC$5.25
Atomic Energy Commission, Washington, D.C.
UNDERGROUND NUCLEAR TESTING PROGRAM. NEVADA TEST SITE.
Draft environmental impact statement.
Oct 72, 65p ELR-5614, WASH-1526

Descriptors: (*Environmental surveys, *Underground explosions), (*Nevada, Environmental surveys), Nuclear explosions, Ground motion, Radioactive contaminants, Hydrology, Test methods, Nuclear explosion effects.
Identifiers: *Environmental impact statements, *Underground nuclear testing program.

This environmental statement covers all underground nuclear tests and preparations for tests

of one megaton (1 MT) or less at the Nevada Test Site (NTS). If earth-moving-type tests or tests of yields above 1 MT should be planned, these will be covered by separate environmental statements. The probable impact on the environment due to continued underground nuclear testing at the NTS will be small. This statement is based in part, upon the experience gained from previous underground nuclear tests executed since the signing of the limited test ban treaty in 1963. A large amount of radioactive matter will be created in the underground cavities formed by the nuclear detonations. In spite of carefully planned and executed preventive measures, inadvertent release of radioactivity, which may be detectable offsite, is a possibility. While there is no way of providing absolute assurance that no radioactivity will be released offsite, the chance of there being any substantial offsite release is very small. Even so, precautions are taken on each test to protect the public in case any release does occur. The terrestrial ecosystem will be affected by testing due to the creation of several new subsidence craters (surface sinks above the point of nuclear detonations), in addition to those already in existence. Larger yield tests may be expected to create minor rockfalls along cliff faces on the NTS. The question of triggering damaging earthquakes through premature release of natural energy stored in the ground has been examined.

EIS-NY-72-5559-F PC$6.50/MF$0.95
Federal Highway Administration, Albany, N.Y. New York Div.
THE ROUTE 9D, BEACON ARTERIAL, DUTCHESS JUNCTION TO INTERSTATE ROUTE 84, DUTCHESS COUNTY, NEW YORK.
Final environmental impact statement.
Nov 72, 89p ELR-5559
Supersedes report dated 8 Oct 71, PB-203 317-D.
Prepared in cooperation with New York State Dept. of Transportation.

Descriptors: (*Environmental surveys, *Highways), (*New York, Environmental surveys), Construction, Improvement, Land use, Right of way acquisition, Urban renewal.
Identifiers: *Environmental impact statements, New York Route 9D, Dutchess County (New York).

The report discribes the proposal for the construction of route 9D-Beacon Arterial which is located in southern Dutchess County in the State of New York. It begins just south of the hamlet of Dutchess Junction and extends about 3.5 miles northerly, to Interstate Route 84. A summary of environmental impacts is given.

EIS-NY-72-5586-F PC$3.25/MF$0.95
Army Engineer District, Buffalo, N.Y.
RECTIFICATION OF DEFICIENCIES IN COMPLETED LOCAL PROTECTION PROJECT, WELLSVILLE, NEW YORK.
Final environmental impact statement.
29 Feb 72, 22p ELR-5586
Supersedes report dated 23 Apr 71, PB-198 734-D.

Descriptors: (*Environmental surveys, *Flood control), (*New York, Environmental surveys), Construction, Sedimentation, Fishes, Levees, Dredging, Channel improvement.
Identifiers: *Environmental impact statements, *Wellsville (New York).

The project consists of modifications to the existing channel to contain flood flows within the river channels at reduced velocities and to decrease future bank erosion to an acceptable level. The adverse and beneficial environmental impacts are discussed. (Author)

EIS-NY-72-5613-F PC$3.50/MF$0.95
General Services Administration, Washington, D.C.
THE DISPOSAL (EXCHANGE) OF LAND AT FORMER MITCHEL AIR FORCE BASE, HEMPSTEAD, NEW YORK.
Final environmental impact statement.
Nov 72, 30p GSA-G-NY-567B-EIS-F ELR-5613
Supersedes report dated 1 Aug 72, EIS-NY-72-5017-D.

Descriptors: (*Environmental surveys, *Land development), (*New York, Environmental surveys), Land use, Military facilities.
Identifiers: *Environmental impact statements, *Land exchange, Hempstead (New York), *Mitchel Air Force Base.

The property to be conveyed by the Government to the county of Nassau consists of two parcels of land which were formerly a part of the former Mitchel Air Force Base, located in Hempstead, New York. One parcel contains 49.16 acres and the other contains 6.26 acres for a total of 55.42 acres. Both parcels are a short distance south of Stewart Avenue, a main thoroughfare, and south of the Long Island Railroad right-of-way. They are interior properties, with a single frontage along Oak Street which dead ends at the Long Island Railroad right-of-way, and they are adjacent to other lands of the former Mitchel Air Force Base which were previously acquired by the county of Nassau. The property to be conveyed by the county of Nassau to the Government in exchange for the land described above consists of two parcels of land which were also a part of the former Mitchel Air Force Base. One parcel contains 22.5 acres and the other 15.5 acres, for a total of 38 acres. The larger parcel abuts the southerly side of Stewart Avenue and has substantial frontage along that street. The other parcel is northeast of the Stewart Avenue and Meadowbrook Parkway intersection. It also has desireable frontage along public streets.

EIS-OH-72-5569-D PC$3.00
Ohio River Div. Labs., Cincinnati.
CONSTRUCTION OF MOORING FACILITIES, OHIO RIVER NAVIGATION SYSTEM.
Draft environmental impact statement.
Aug 72, 18p ELR-5569

Descriptors: (*Environmental surveys, *Moorings), (*Ohio, Environmental surveys), Rivers, Buoys.
Identifiers: *Ohio River, *Monongahela River, *Allegheny River, *Kentucky River, *Green River, *Cumberland River, *Environmental impact statements.

The action concerns the proposed construction and maintenance of mooring facilities at various sites in the waters of the Ohio River and its navigable tributaries (excluding the Tennessee River Basin). The proposed anchorages are intended primarily for use in emergency situations to make the waterways safer for all users.

EIS-OH-72-5573-F PC$8.75/MF$0.95
Ohio River Basin Commission, Cincinnati.
COMPREHENSIVE BASIN STUDY ON WABASH RIVER, ILLINOIS, INDIANA AND OHIO.
Final environmental impact statement.
Mar 72, 134p ELR-5573
Supersedes report dated 18 Oct 71, PB-203 615-D.

Descriptors: (*Environmental surveys, *River basin development), (*Illinois, Environmental surveys), (*Indiana, Environmental surveys), (*Ohio, Environmental surveys), Multiple purpose reservoirs, Watersheds, Flood control, Water supply, Waste treatment, Land development, Fishing grounds.
Identifiers: *Environmental impact statements, *Wabash River Basin.

The report describes the proposal for the Wabash River Basin planning program. Projects currently included in agency programs, are as follows: Thirteen major multiple purpose reservoirs; A total of 147 small watershed projects for flood control, water supply, water quality control and recreation; Land treatment and conservation measures; Waste treatment service areas; Two coal mine drainage pollution abatement project; Additional municipal and industrial water supplies; and Flood protection projects. Environmental impacts are given.

EIS-OK-72-5599-D PC$5.25
Federal Aviation Administration, Washington, D.C. Airports Service.
PROPOSED WILL ROGERS MUNICIPAL AIRPORT, CITY OF CLAREMORE, OKLAHOMA.
Draft environmental impact statement.
Nov 72, 61p ELR-5599

Descriptors: (*Environmental surveys, *Airports), (*Oklahoma, Environmental surveys), Urban planning, Air transportation, Air traffic, Passenger transportation, Economic development, Community development.
Identifiers: *Environmental impact statements, Claremore (Oklahoma).

The purpose of the proposed project is to provide a replacement facility for the existing airport which is inadequate in length (less than 3000 feet), has poor wind orientation (5/23), is not paved, is not lighted, is poorly situated with respect to the city and cannot be lengthened due to surrounding land uses. The lengthening of the existing runway which is at 50 degrees to the prevailing winds would be contributing to the permanent establishment of a safety hazard. The development at the existing site is further hindered by the close proximity, to the south and southeast, of the Claremore Health Center, an elementary school, the proposed construction of a high school, an existing nursing home, apartments, and fully developed subdivisions. The existance of the elementary school and proposed location of a new high school as well as the other existing facilities indicates that the best use of the surrounding lands as well as the airport property itself, is best suited for residential development.

EIS-OR-72-4666-F-S PC$3.00/MF$0.95
Army Engineer District, Portland, Oreg.
LOST CREEK LAKE PROJECT, ROGUE RIVER, OREGON.
Oct 72, 12p ELR-4666-F-S
Supplement no. 2 to Final report dated 7 Jun 72, EIS-OR-72-4666-F.

Descriptors: (*Environmental surveys, *Earth dams), (*Oregon, Environmental surveys), Rivers, Reservoirs, Geological surveys, Earthquakes.
Identifiers: *Environmental impact statements, Lost Creek Lake Project, Rogue River.

Presents information on the geology of the project area. Gives information on reservoir slope stability, seismicity, and possible effects of earthquakes on the reservoir.

EIS-OR-72-5554-D PC$3.50
National Park Service, Seattle, Wash. Pacific Northwest Region.
PROPOSED JOHN DAY FOSSIL BEDS NATIONAL MONUMENT, OREGON.
Draft environmental impact statement.
31 Oct 72, 26p ELR-5554, DES-72-109

Descriptors: (*Environmental surveys, *National parks), (*Oregon, Environmental surveys), Monuments, Land use, Farms, Grassland, Relocation, Residential buildings.
Identifiers: *Environmental impact statements, John Day Fossil Beds National Monument.

The report describes the proposal for the National Park Service to establish the John Day Fossil Beds National Monument, and area of 14,402 acres in Oregon. Three existing State parks would be in-

cluded. A summary of environmental impact and adverse environmental effects is given.

EIS-OR-72-5575-D PC$21.75
Forest Service, Portland, Oreg. Pacific Northwest Region.
CALENDAR YEAR 1973, HERBICIDE USE ON THE DESCHUTES, FREMONT, OCHOCO, AND WINEMA NATIONAL FORESTS.
Draft environmental impact statement.
31 Oct 72, 391p ELR-5575, USDA-FS-DES (Adm)-73-30

Descriptors: (*Environmental surveys, *Forestry), (*Oregon, Environmental surveys), (*Herbicides, Environmental surveys), Softwoods, Forage grasses, Weed control, Toxicology, Water pollution.
Identifiers: *Environmental impact statements, Amitrole, T2-4-5 herbicide, D2-4 herbicide, Picloram, Silvex, Crook County (Oregon), Deschutes County (Oregon), Grant County (Oregon), Harney County (Oregon), Jefferson County (Oregon), Klamath County (Oregon), Lake County (Oregon), Wheeler County (Oregon), *National forests, Deschutes National Forest, Fremont National Forest, Ochoco National Forest, Winema National Forest.

The statement covers the proposed Forest Service use of Amitrole, Dicamba, 2,4,5-T, 2,4-D, Silvex and Picloram on the following National Forests: Deschutes, Fremont, Ochoco and Winema. These Forests are all in the State of Oregon. The use of these chemicals will put herbicide residues into the environment in varying amounts. There is a hazard to wildlife in the altering or elimination of the habitat. If units to be treated are kept small, the hazard is minimized or eliminated.

EIS-PA-72-5545-F PC$5.50/MF$0.95
Federal Highway Administration, Harrisburg, Pa. Pennsylvania Div.
L.R. 1070 (U.S. ROUTE 30 RELOCATED), ADAMS COUNTY, PENNSYLVANIA.
Final environmental impact statement.
Aug 72, 66p ELR-5545
Supersedes report dated 7 Jul 71, PB-200 747-D. Prepared in cooperation with Pennsylvania State Dept. of Transportation.

Descriptors: (*Environmental surveys, *Highways), (*Pennsylvania, Environmental surveys), Bypasses, Urban areas, Land use.
Identifiers: *Environmental impact statements, *Gettysburg (Pennsylvania), Adams County (Pennsylvania).

The project is a 10.1 mile, four lane, limited access, relocation of U.S. Route 30 to the north of Gettysburg, Pennsylvania. The three townships of Franklin, Cumberland and Straban in Adams County are affected by the project.

EIS-PA-72-5605-F PC$16.75/MF$0.95
Federal Highway Administration, Harrisburg, Pa. Pennsylvania Div.
APPALACHIAN CORRIDOR 'M', ROUTE 1101 SECTIONS 3, 4, AND 5 (T.R. 22), BLAIR COUNTY AND APPALACHIAN CORRIDOR 'O', ROUTE 1061 SECTIONS 4 AND 5 (T.R. 220), BLAIR COUNTY, PENNSYLVANIA.
Final environmental impact statement.
Nov 72, 293p FHWA-PA-EIS-71-22-F ELR-5605
Supersedes report dated 22 Jul 71, PB-201 245-D. Prepared in cooperation with Pennsylvania State Dept. of Transportation.

Descriptors: (*Environmental surveys, *Highways), (*Pennsylvania, Environmental surveys), Traffic engineering, Interchanges, Eminent domain, Schools, Parks, Pollution, Land use.
Identifiers: *Environmental impact statements, *Blair County (Pennsylvania), Pennsylvania route 1061, Pennsylvania route 1101.

The project consists of construction of three sections of state route 22 and two sections of state route 220 in Blair County, Pennsylvania, for the purpose of increasing safety and facilitating traffic. Environmental effects include the displacement of a number of residences and business establishments.

EIS-PI-72-5560-F PC$4.75/MF$0.95
American Samoa Dept. of Public Works, Pago Pago.
TUTUILA PERIMETER ROAD, TERS-115 (1), VATIA TO AFONO ISLAND OF TUTUILA, AMERICAN SAMOA.
Final environmental impact statement.
Oct 72, 54p FHWA-AS-EIS-72-02-F ELR-5560
Prepared in cooperation with Department of Transportation.

Descriptors: (*Environmental surveys, *Roads), (*American Samoa, Environmental surveys), Construction, Rural areas, Travel.
Identifiers: *Environmental impact statements, Tutuila Island, Territorial highway 115.

The proposed road, a 2-lane, paved facility, is part of the Government of American Samoa's Territorial Highway System. The new road will introduce cars into the village where none now exist, and will provide greater mobility to the people.

EIS-PI-72-5565-F PC$5.00/MF$0.95
American Samoa Dept. of Public Works, Pago Pago.
TUTUILA PERIMETER ROAD, TERS-106 (1), AFONO TO MASEFAU, ISLAND OF TUTUILA, AMERICAN SAMOA.
Final environmental impact statement.
Oct 72, 56p FHWA-AS-EIS-72-01-F ELR-5565
Prepared in cooperation with Department of Transportation.

Descriptors: (*Environmental surveys, *Roads), (*American Samoa, Environmental surveys), Construction, Travel, Rural areas, Improvement.
Identifiers: *Environmental impact statements, *Tutuila Island, Territorial highway 106.

The proposed road, a 2-lane, paved facility, is part of the Government of American Samoa's territorial highway system. The new road will introduce cars into the village of Afono, where none now exist, thus changing the character of the village. It will provide greater mobility to the people.

EIS-RI-72-5601-D PC$3.25
Corps of Engineers, Waltham, Mass. New England Div.
MAINTENANCE DREDGING, PAWTUXET COVE, RHODE ISLAND.
Draft environmental impact statement.
1 Aug 72, 25p ELR-5601

Descriptors: (*Environmental surveys, *Dredging), (*Rhode Island, Environmental surveys), Channels (Waterways), Mooring, Spoil, Maintenance, Safety.
Identifiers: *Environmental impact statements, *Providence County (Rhode Island), *Pawtuxet River.

Maintenance dredging of the Federal navigation project in Pawtuxet Cove is proposed for FY 73. Approximately 45,000 cubic yards of shoal material will be removed and disposed of at an approved spoil site. Adverse and beneficial environmental impacts are discussed. (Author)

EIS-SC-72-5595-D PC$3.00
Federal Highway Administration, Columbia, S.C. South Carolina Div.
PROPOSED CONSTRUCTION OF THE SHAW FREEWAY AT SUMTER, SOUTH CAROLINA.
Draft environmental impact statement.
Nov 72, 15p FHWA-SC-EIS-72-09-D ELR-5595
Prepared in cooperation with South Carolina State Highway Dept.

Descriptors: (*Environmental surveys, *Highways), (*South Carolina, Environmental surveys), Highway planning, Divided highways, Freeways, Limited-access highways.
Identifiers: *Sumter (South Carolina), Shaw Freeway, *Environmental impact statements.

The proposed highway development is the Shaw Freeway at the City of Sumter in Sumter County, South Carolina. The highway would extend from U.S. 76/378 near Shaw Air Force Base to the western outskirts of Sumter, a distance of about seven miles. A summary of the environmental impacts are: Improved traffic flow between Sumter and Shaw Air Force Base area, basis for future land development, displacement of residences and businesses, removal of forest and agricultural land from production, inconveniences to motorists and residents during construction, and introduction of noise and air pollution into corridor.

EIS-TX-72-5578-F PC$4.50/MF$0.95
International Boundary and Water Commission, El Paso, Tex. Planning and Reports Branch.
RESTORATION OF HISTORIC LOW FLOW DIVERSION TO ARROYO, COLORADO. LOWER RIO GRANDE FLOOD CONTROL PROJECT, TEXAS.
Final environmental impact statement.
Oct 72, 50p IBWC-PRB-EIS-72-1-F ELR-5578
Supersedes report dated 26 Jun 72, EIS-TX-72-4838-D Prepared in cooperation with Corps of Engineers, Dallas, Tex.

Descriptors: (*Environmental surveys, Flood control), (*Texas, Environmental surveys), Flood routing, Construction, Embankments.
Identifiers: *Environmental impact statements, *Rio Grande River.

Construction is proposed by the United States of a low earth sill in the entrance to the North Floodway to restore diversion of low flows to the Arroyo Colorado before flows begin into the North Floodway. The low flow diversion will be increased from the current 700 cfs to the prior condition of 1400 cfs before flows begin into North Floodway, thus restoring drainage conditions to lands outside of and draining into the North Floodway. A summary of environmental impact and adverse environmental effects is given.

EIS-TX-72-5611-D PC$4.00
Federal Highway Administration, Austin, Tex. Texas Div.
U.S. HIGHWAY 82, FROM 0.4 MILE EAST OF SOUTHERN PACIFIC RAILROAD IN SHERMAN, EAST TO THE INTERSECTION OF PROPOSED F.M. HIGHWAY 1417, GRAYSON COUNTY, TEXAS.
Draft environmental impact statement.
Nov 72, 36p FHWA-TEX-EIS-72-24-D ELR-5611
Prepared in cooperation with Texas State Highway Dept.

Descriptors: (*Environmental surveys, *Highways), (*Texas, Environmental surveys), Highway planning, Limited-access highways, Relocation, Divided highways.
Identifiers: *Grayson County (Texas), US highway 82, *Environmental impact statements.

The statement concerns a 1.4 mile section of U.S. Highway 82 in Grayson County, Texas. The route begins 0.4 mile east of the Southern Pacific Railroad in northeast Sherman and ends at the proposed intersection of U.S. 82 and F.M. 1417. The entire route will be new location. An existing controlled-access freeway section of U.S. 82 will be extended eastward 1.4 miles to an intersection with the proposed extension of F.M. 1417. Completion of this project and the proposed 1.4 mile section of F.M. 1417 will provide a temporary connection from existing U.S. 82 to proposed U.S.

82 east of Sherman. This would create a safer and more efficient route around Sherman for through traffic on U.S. 82. In addition, local economy would be stimulated by residential and commercial construction along the new route. The major adverse affects will be the taking of additional grass and wooded areas into the right-of-way and the displacement of two homes. These effects will be minimized by proper erosion control and relocation advisory assistance.

EIS-TX-72-5612-D PC$4.25
Federal Highway Administration, Austin Tex. Texas Div.
U.S. HIGHWAY 59 FROM A POINT ON EXISTING U.S. HIGHWAY 59, NEAR LIVINGSTON SOUTH CITY LIMITS, NORTH, NORTHWEST AND NORTHEAST 5.3 MILES TO A POINT ON EXISTING U.S. HIGHWAY 59 NORTH OF THE LIVINGSTON NORTH CITY LIMITS. POLK COUNTY, TEXAS.
Draft environmental impact statement.
Nov 72, 44p FHWA-TEX-EIS-72-25-D ELR-5612
Prepared in cooperation with Texas State Highway Dept.

Descriptors: (*Environmental surveys, *Highways), (*Texas, Environmental surveys), Highway planning, Divided highways, Highway improvement, Relocation, Transportation management.
Identifiers: *Polk County (Texas), *Environmental impact statements, U.S. Highway 59.

This project consists of the proposed U.S. Highway 59 By-pass around the west side of the City of Livingston, Texas, consisting of a four lane divided highway facility with two way frontage roads on both sides with controlled access extending from a point on existing U.S. Highway 59 near Livingston South City Limits and extending north, northwest and northeast 5.3 miles to a point on existing U.S. Highway 59 north of the Livingston North City Limits, in Polk County, Texas. Relocation of this main North-South traffic artery through East Texas from its present location through the center of the City of Livingston would provide safer, faster and more efficient flow of traffic and relieve badly congested and hazardous traffic in the City and should result in rapid residential and commercial development along the proposed route around the fringe of the City and aid the local economy. Adverse environmental effects would be negligible.

EIS-VA-72-5568-D PC$4.00
Department of Housing and Urban Development, Richmond, Va. Richmond Area Office.
FAIR OAKS APARTMENTS (236), HENRICO COUNTY, VIRGINIA.
Draft environmental impact statement.
Oct 72, 38p HUD-R03-EIS-72-5 ELR-5568
Prepared in cooperation with Realty Industries, Inc., Richmond, Va.

Descriptors: (*Environmental surveys, *Apartment buildings), (*Virginia, Environmental surveys), Construction, Land use, Aircraft noise.
Identifiers: *Environmental impact statements, Henrico County (Virginia).

The project is a 13 building, 100 apartment complex being constructed under Section 236 of the National Housing Act. The proposed project (named Fair Oaks Apartments by the developer) is located on a 9 acre site in Henrico County, Virginia in an area known as Highland Springs. It is located 0.3 miles northeast along East Avenue from the intersection of Airport Drive and Nine Mile Road. Due to the site's proximity to the Richard E. Byrd Airport, the site is located in CNR (Composite Noise Rating) Zone 2. A summary of environmental impacts and adverse environmental effects is given.

EIS-VA-72-5594-D PC$5.75
Federal Highway Administration, Richmond, Va. Virginia Div.
ROUTE 265, DANVILLE EXPRESSWAY, VIRGINIA.
Draft environmental impact statement.
Nov 72, 72p FHWA-VA-EIS-72-08-D ELR-5594
Prepared in cooperation with Virginia State Dept. of Highways.

Descriptors: (*Environmental surveys, *Highways), (*Virginia, Environmental surveys), Construction, Relocation, Residential buildings, Forest land, Farms.
Identifiers: *Environmental impact statements, Virginia route 265, Danville (Virginia).

The proposed corridor for the multilaned highway will begin on Route 29 south of Danville at the Virginia-North Carolina State Line, continues in an easterly and northeasterly direction to Route 58 east of Danville, and then northwesterly to intersect with the Franklin Turnpike Extension north of Danville. Franklin Turnpike will be extended from Route 265 to an at grade intersection with existing Franklin Turnpike (Route 41) and Northmont Boulevard on Route 29 in the city of Danville. The purpose of this Draft Environmental Statement is to discuss the probable environmental impact of the proposed multilaned, limited access facility in the county of Pittsylvania and the city of Danville.

EIS-WA-72-5582-F PC$4.00/MF$0.95
Bureau of Sport Fisheries and Wildlife, Washington, D.C.
PROPOSED SAN JUAN WILDERNESS AREA, WASHINGTON.
Final environmental impact statement.
Nov 72, 37p ELR-5582, FES-72-39
Supersedes report dated 26 Jan 72, PB-206 110-D.

Descriptors: (*Environmental surveys, *National parks), (*Washington (State), Environmental surveys), Wildlife, Conservation, Rural areas, Recreational facilities.
Identifiers: *Environmental impact statements, San Juan County (Washington).

The Bureau of Sport Fisheries and Wildlife, U.S. Department of the Interior, proposes that a portion of the Matia Island and San Juan National Wildlife Refuges be designated as wilderness within the National Wilderness Preservation System. This proposal embraces six undisturbed islands--Puffin, Colville, Bare and Buck Islands, and Bird and Williamson Rocks--comprising approximately 28 acres, plus 140 acres of the 145-acre Matia Island, all located within San Juan and Skagit counties, Washington. The proposal was considered at a public hearing in August 1971.

EIS-WA-72-5609-F PC$12.75/MF$0.95
Environmental Protection Agency, Seattle, Wash. Region X.
PROPOSED SEWERAGE FACILITIES, RICHLAND, WASHINGTON, WPC-WN-419, (C-530419).
Final environmental impact statement.
Nov 72, 234p ELR-5609
Supersedes report dated 11 Jan 72, PB-205 672-D.

Descriptors: (*Environmental surveys, *Sewage treatment), (*Washington (State), Environmental surveys), Revisions, Construction, Community development, Wildlife, Land use.
Identifiers: *Environmental impact statements, *Richland (Washington).

The city of Richland desires to modify the existing sewage treatment plant, install alarm reporting systems at all lift stations, and construct a 21 inch gravity and 10 inch pressure sewer and lift station to serve the Badger Mountain area south of the Yakima River. There will be some environmental impact but adverse effects are not expected.

EIS-WI-72-5553-F PC$4.00/MF$0.95
Federal Highway Administration, Madison, Wis. Wisconsin Div.
RHINELANDER BYPASS, U.S.H. 8, ONEIDA COUNTY, WISCONSIN.
Final environmental impact statement.
Nov 72, 36p FHWA-WISC-EIS-71-31-F ELR-5553
Supersedes report dated 9 Sep 71, PB-202 584-D.
Prepared in cooperation with Wisconsin State Dept. of Transportation.

Descriptors: (*Environmental surveys, *Highways), (*Wisconsin, Environmental surveys), Relocation, Land use, Bypasses, Traffic engineering.
Identifiers: *Environmental impact statements, *Oneida County (Wisconsin), US highway 31.

The report covers a proposed relocation of Highway 8 bypassing the City of Rhinelander in Oneida County, Wisconsin. The proposed bypass facility is 5 1/2 miles in length. Approximately 300 acres of woodlands and urban fringe lands will be coverted to highway purposes. The relocation will decrease through traffic on existing Highway 8 which may affect the community character. Little change in noise, air or water pollution is anticipated. Public safety and scenic quality will be improved. No historical sites or parks are affected.

EIS-WI-72-5571-D PC$4.50
Federal Aviation Administration, Washington, D.C. Airports Service.
AIRPORT, CITY OF TOMAHAWK, LINCOLN COUNTY, WISCONSIN.
Draft environmental impact statement.
Oct 72, 48p ELR-5571

Descriptors: (*Environmental surveys, *Airports), (*Wisconsin, Environmental surveys), Construction, Land use, Right of way acquisition, Roads, Runways, Farms, Wildlife.
Identifiers: *Environmental impact statements, Lincoln County (Wisconsin).

The report describes the proposal for financial assistance to construct an airport located in Lincoln County, Wisconsin. The project includes: Land acquisition-420 acres; Construct E/W runway; Construct apron and connecting taxiway; Road relocation; Construct entrance road and auto parking; and, Install rotating beacon. Environmental impacts are given.

EIS-WI-72-5600-F PC$3.75/MF$0.95
Coast Guard, Washington, D.C.
PROJECT 4686-1-00: PROPOSED BRIDGE ACROSS LITTLE LAKE BUTTE DES MORTS (FOX RIVER), MENASHA, WINNEBAGO COUNTY, WISCONSIN.
Final environmental impact statement.
Nov 72, 34p ELR-5600
Prepared in cooperation with Wisconsin State Dept. of Transportation.

Descriptors: (*Environmental surveys, *Highway bridges), (*Wisconsin, Environmental surveys), Traffic safety, Air pollution, Noise (Sound), Landscaping, Esthetics.
Identifiers: *Environmental impact statements, *Winnebago County (Wisconsin).

The Wisconsin Department of Transportation has applied for a Coast Guard permit to construct a medium-level highway bridge across Little Lake Butte des Morts of the Fox River, Mile 36, at Menasha, Wisconsin. The project will provide for a structure crossing Little Lake Butte des Morts at a point just North of Ninth Street which approximately defines the north limits of the City of Menasha. Included in the bridge project will be related east approach work necessary to provide for interim operation of the structure until such time as the Tri-County Expressway is extended north and east to Outagamie and Calumet Counties. The westerly approach is to be constructed as a part of the work involved in providing the planned access closure on U.S. Highway 41. This closure work

constitutes eliminating all present grade crossings and direct access to U.S. Highway 41 by the construction of grade separations, interchanges, and frontage roads where necessary.

EIS-WI-72-5607-F PC$5.00/MF$0.95
Federal Highway Administration, Madison, Wis. Wisconsin Div.
I.D. 1206-0-00. PROJECT F 04-2 ( ), SOUTH MADISON BELT LINE (FISH HATCHERY ROAD-I.H. 90 SECTION), U.S.H.12 AND 18, DANE COUNTY, WISCONSIN.
Final environmental impact statement.
Nov 72, 60p FHWA-WISC-EIS-71-13-F ELR-5607
Supersedes report dated 22 Mar 72, PB-207 738-D.
Prepared in cooperation with Wisconsin State Dept. of Transportation.

Descriptors: (*Environmental surveys, *Highways), (*Wisconsin, Environmental surveys), Turbidity, Streams, Trees (Plants), Noise (Sound), Air pollution.
Identifiers: *Environmental impact statements, *Dane County (Wisconsin), Madison (Wisconsin).

The purpose of this project is to provide a safe, efficient, economical and desirable transportation facility for the existing and anticipated traffic volumes for 1990 and beyond. The existing facility is overtaxed and must provide the traffic capacity as well as access for all of the abutting development. The traffic is increasing annually at a steady rate while service has correspondingly deteriorated to a state of perilous operation. Because of physical limitations placed by surrounding bodies of water, no reasonable alternate street or highway is available for relief of the traffic. This is the only east-west corridor in the Madison area south of the city's isthmus. The completed project will provide a modern high-type facility that will offer necessary capacity, service and safety for the design year of 1990 and will give a desired means of direct access to the central business districts of Madison and Monona. The existing Belt Line between Raywood Road and Highway 51 will remain as a local arterial to serve the existing properties and maintain traffic circulation. Restricting access to the freeway through interchanges creates a higher level of service and maintains safety of operation for the freeway traveler.

EIS-WV-72-5581-F PC$6.75/MF$0.95
Ohio River Basin Commission, Cincinnati.
KANAWHA RIVER COMPREHENSIVE BASIN STUDY, NORTH CAROLINA, VIRGINIA, AND WEST VIRGINIA.
Final environmental impact statement.
Nov 72, 92p ELR-5581
Supersedes report dated 18 Oct 71, PB-203 616-D.
Prepared in cooperation with Water Resources Council, Washington, D.C.

Descriptors: (*Environmental surveys, *River basin development), (*North Carolina, Environmental surveys), (*Virginia, Environmental surveys), (*West Virginia, Environmental surveys), Flood control, Multipurpose reservoirs, Hydroelectric power generation, Land development, Recreational facilities, Wildlife, Relocation, Streams.
Identifiers: *Environmental impact statements, Kanawha River.

The comprehensive river basin study (Type II) of the Kanawha River, North Carolina, Virginia and West Virginia, has been completed by the Kanawha River Basin Coordinating Committee, a State-Federal interagency committee, and submitted to the Ohio River Basin Commission. The report recommends a comprehensive plan for the utilization of the water and related land resources of the Kanawha River Basin. The projects and programs of the comprehensive plan would provide flood damage prevention, augmentation of low flows in the stream, hydroelectric power, land treatment, non-structural measures for the protection and preservation of unique and scenic environmental areas, National Forest development, and recreation and wildlife areas. Proposed structural measures would have some adverse effects including loss of free-flowing streams, loss of wildlife habitat, relocation of people and changes in stream fishery. However, such impacts will be minimized by planning and management, so that the consequences of uses are recognized and properly evaluated.

N72-28346 PC$3.50/MF$0.95
Metropolitan Washington Council of Governments, D.C.
REMOTE SENSING PROJECT.
Final Report
H. J. Mallon, and J. Y. Howard. Feb 72, 29p
NASA-CR-127474, TR-8
Contract NASA ORDER W-13318, DI-14-08-0001-12708

Descriptors: *District of columbia, *Remote sensors, *Urban planning, Earth resources, Earth resources program, Maryland, Virginia.

For abstract, see STAR 10 19.

N72-28348 PC$4.50/MF$0.95
Metropolitan Washington Council of Governments, D.C.
BENEFITS FROM REMOTE SENSING DATA UTILIZATION IN URBAN PLANNING PROCESSES AND SYSTEM RECOMMENDATIONS.
H. J. Mallon, and J. Y. Howard. Jan 72, 49p
NASA-CR-127496, TR-6
Contract NASA ORDER W-13318, DI-14-08-0001-12708

Descriptors: *District of columbia, *Remote sensors, *Urban planning, Air pollution, Earth resources, Earth resources program, Floods, Land use, Maryland, Soils, Urban transportation, Virginia, Water pollution.

For abstract, see STAR 10 19.

N72-28524 PC$4.50/MF$0.95
Toronto Univ. (Ontario). Inst. for Aerospace Studies.
A COMPARATIVE STUDY OF LASER METHODS OF AIR POLLUTION MAPPING.
R. M. Measures. Dec 71, 47p UTIAS-174

Descriptors: *Air pollution, *Gases, *Remote sensors, Absorption, Fluorescence, Lasers, Scattering.

For abstract, see STAR 10 19.

N72-28645 PC$3.25/MF$0.95
Istituto Di Fisica Dell Atmosfera, Rome (Italy).
ENVIRONMENTAL POLLUTION IN LATIUM, PARTICULARLY ATMOSPHERIC POLLUTION . LINQUINAMENTO AMBIENTALE NEL LAZIO CON PARTICOLARE RIGUARDO A QUELLO ATMOSFERICO.
L. Mammarella. Mar 71, 21p IFA-RDP-39

Descriptors: *Air pollution, *Environment pollution, Exhaust gases, Heating, Human wastes, Italy, Urban transportation, Waste disposal, Water pollution.

For abstract, see STAR 10 19.

N72-28646 PC$3.00/MF$0.95
Istituto Di Fisica Dell Atmosfera, Rome (Italy).
ENVIRONMENTAL POLLUTION AND ITS RELATION TO URBAN PLANNING AND THE MICROMETEOROLOGY OF CITIES . LINQUINAMENTO AMBIENTALE E I SUOI RAPPORTI CON LASSETTO URBANISTICO E LA MICROMETEOROLOGIA DEGLI AGGLOMERATI URBANI.
L. Mammarella. Dec 70, 12p IFA-RDP-34
Conf- Presented At the 1st Bien. Conf. on le Forme Dellambiente Umano, Rimini, Italy, 20-25 Sep. 1970

Descriptors: *Environment pollution, *Micrometeorology, *Urban planning, Air pollution, Exhaust gases, Urban transportation, Water pollution.

For abstract, see STAR 10 19.

N72-28647 PC$7.75/MF$0.95
Istituto Di Fisica Dell Atmosfera, Rome (Italy).
PROGRESSION OF URBAN ATMOSPHERIC POLLUTION (COMPARISON OF POLLUTION RATE DURING DIFFERENT SEASONS IN A LARGE RESIDENTIAL AREA) . ANDAMENTO DELLINQUINAMENTO ATMOSFERICO URBANO (COMPARAZIONE DEI VALORI DI INQUINAMENTO INTERSTAGIONALI IN UN QUARTIERE RESIDENZIAL ESTENSIVO).
L. Mammarella. Feb 71, 115p IFA-TR-35
LANG- IN ITALIAN ENGLISH SUMMARY

Descriptors: *Aerosols, *Air pollution, *Urban research, Carbon compounds, Dust, Exhaust gases, Italy, Nitrogen oxides, Particle size distribution, Sulfur oxides.

For abstract, see STAR 10 19.

N72-28650 PC$3.50/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
ATMOSPHERIC POLLUTION, SMOKE, AND SULFUR DIOXIDE . POLLUTION ATMOSPHERIQUE, FUMEE ET ANHYDRIDE SULFUREUX BULLETIN MENSUEL, DECEMBRE 1969.
Monthly Bulletin, Jul. 1971
Jul 71, 28p
Subm- Prepared Jointly With Inst. Dhyg. Et Depidemiol.

Descriptors: *Air pollution, *Belgium, *Smoke, *Sulfur oxides, Air sampling, Tables (data), Weather stations.

For abstract, see STAR 10 19.

N72-29646 PC$3.50/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
ATMOSPHERIC POLLUTION, SMOKE, AND SULFUR DIOXIDE . POLLUTION ATMOSPHERIQUE, FUMEE ET ANHYDRIDE SULFUREUX BULLETIN MENSUEL, AOUT 1971.
Monthly Bulletin Aug. 1971
Aug 71, 28p
Subm- Prepared Jointly With Inst. Dhyg. Et Depidemiol.

Descriptors: *Air pollution, *Belgium, *Smoke, *Sulfur oxides, *Tables (data), Air sampling, Weather stations.

For abstract, see STAR 10 20.

N72-29971 PC$4.50/MF$0.95
Research Triangle Inst., Durham, N.C.
APPLICATIONS OF AEROSPACE TECHNOLOGY IN THE ENVIRONMENTAL SCIENCES.
Interim Report, 11 Oct. 1971 - 10 Apr. 1972
31 May 72, 50p NASA-CR-127787
Contract NASW-2343

Descriptors: *Aerospace sciences, *Environmental control, *Technology utilization, Air pollution, Ecology, Mathematical models, Monitors.

For abstract, see STAR 10 20.

N72-30318 PC$7.50/MF$0.95
California Univ., Riverside. Dept. of Geography.

MONITORING THE EVOLVING LAND USE PATTERNS USING REMOTE SENSING.
D. R. Goehring. Oct 71, 110p NASA-CR-127834, T-71-5
Contracts NGL-05-003-404, N00014-69-A-0200-5001

Descriptors: *Aerial photography, *Remote sensors, *Rural land use, *Urban development, California, Earth resources, Urban planning.

For abstract, see STAR 10 21.

N72-30392 PC$4.75/MF$0.95
Metropolitan Washington Council of Governments, D.C. Dept. of Health and Environmental Protection.
AN ASSESSMENT OF REMOTE SENSOR IMAGERY IN THE DETERMINATION OF HOUSING QUALITY DATA.
H. J. Mallon, and J. Y. Howard. Nov 71, 52p
NASA-CR-127865, USGS-IR-NASA-228
Contract NASA ORDER W-13318, DI-14-08-0001-12708

Descriptors: *Aerial photography, *Photointerpretation, *Urban research, Communities, Mapping, Photogrammetry, Sociology, Surveys.

For abstract, see STAR 10 21.

N72-30560 PC$3.50/MF$0.95
Istituto Di Fisica Dell Atmosfera, Rome (Italy).
RELATION BETWEEN URBAN MICROMETEOROLOGY AND ATMOSPHERIC POLLUTION OVER CITIES (METHODOLOGY OF URBAN POLLUTION CHARACTERIZATION) . RAPPORTI FRA MICROMETEOROLOGIA CITTADINA ED INQUINAMENTO ATMOSFERICO URBANO (SCHEMA DI CARATTERIZZAZIONE DELL'INQUINAMENTO CITTADINO).
L. Mammarella. Dec 70, 30p IFA-TR-34

Descriptors: *Air pollution, *Micrometeorology, *Urban research, Aerosols, Air sampling, Contaminants, Dust, Italy, Measuring instruments, Methodology, Tracers.

For abstract, see STAR 10 21.

N72-30565 PC$3.75/MF$0.95
Istituto Di Fisica Dell Atmosfera, Rome (Italy).
ATMOSPHERIC POLLUTION STUDY USING MATHEMATICAL MODELS (CONTROLLED INVESTIGATION PROPOSAL) . LO STUDIO DEGLI INQUINAMENTI ATMOSFERICI MEDIANTE MODELLI MATEMATICI (PROPOSTA DI UNINDAGINE CONTROLLATA).
L. Mammarella. Jan 71, 31p IFA-SR-33

Descriptors: *Atmospheric diffusion, *Effluents, *Mathematical models, Air pollution, Atmospheric turbulence, Chimneys, Environment pollution, Fumes.

For abstract, see STAR 10 21.

PB-212 398 PC$3.00/MF$0.95
Humboldt County Dept. of Public Works, Eureka, Calif.
RURAL STORAGE AND COLLECTION CONTAINER SYSTEMS.
Interim rept. 1 Jun 70-31 Oct 71.
1972, 155P EPA-SW-41D.I-72
Grant G06-EC-00271
Prepared in cooperation with Garretson-Elmendorf-Zinov-Reibin, Consultants.

Descriptors: (*Refuse disposal, *Containers), Storage, Project planning, Rural areas, Collecting methods, Earth fills, Cost analysis, California.
Identifiers: *Solids waste disposal, Humbolt County (California).

The objective of the project was to demonstrate and evaluate two alternative refuse storage and collection container systems for small isolated rural areas, with special emphasis on costs, workability, and community acceptance. The test area for the project is to be the southern one-third of Humboldt County, California, with a population of approximately 10,000 people. In the first system, waste will be deposited in a 40-cu-yd, roll-off container that can be picked up and hauled to the central sanitary landfill. In the second system, waste will be deposited in 8-cu-yd containers. These containers will be emptied at the site into a 42-cu-yd collection vehicle that will then proceed to the next container site or, if full, to the landfill. The interim report details the selection of collection equipment (both containers and vehicles) components, and the development of test procedures for evaluating the storage and collection systems.

PB-212 429 PC$11.25/MF$0.95
Diversified Consultants, Inc., Jackson, Miss.
URBAN SYSTEMS ENGINEERING DEMONSTRATION PROGRAM. VOLUME I: GOALS, OBJECTIVES, AND STANDARDS FOR WATERWORKS, SANITARY SEWERAGE, SOLID WASTE MANAGEMENT, STORM DRAINAGE AND FLOOD PLAIN MANAGEMENT,
James A. Elliott, Ralph L. Waters, and A. Paul Desmarais. 1972, 181p DCI-69-56-01
Prepared in cooperation with Gulf Regional Planning Commission, Gulfport, Miss. Sponsored in part by Department of Housing and Urban Development, Jackson, Miss. See also Volume 2, PB-212 430.

Descriptors: (*Public utilities, *Regional planning), (*Mississippi, Regional planning), (*Waste disposal, Regional planning), Design, Sanitary engineering, Sewage treatment, Water treatment, Storm sewers, Flood control, Water supply, Management, Earthfills, Regulations, Flood plains.
Identifiers: *Solid waste disposal, Hancock County (Mississippi), Harrison County (Mississippi), Jackson County (Mississippi), Pearl County (Mississippi), Sanitary landfills.

The report presents the goals, objectives, and standards of the Gulf Regional Planning Commission (Hancock, Harrison, Jackson, and Pearl Counties, Mississippi) for urban systems services including waterworks, sanitary sewerage, solid waste management, storm drainage and flood plain management. (Author)

PB-212 430 PC$31.50/MF$0.95
Diversified Consultants, Inc., Jackson, Miss.
URBAN SYSTEMS ENGINEERING DEMONSTRATION PROGRAM. VOLUME II: AREA-WIDE WATER AND SANITARY SEWERAGE SYSTEMS FOR WATERWORKS, SANITARY SEWERAGE, SOLID WASTE MANAGEMENT, STORM DRAINAGE AND FLOOD PLAIN MANAGEMENT,
James A. Elliott, Ralph L. Waters, and A. Paul Desmarais. 1972, 590p DCI-69-56-02
Prepared in cooperation with Gulf Regional Planning Commission, Gulfport, Miss. Sponsored in part by Department of Housing and Urban Development, Jackson, Miss. See also Volume 1, PB-212 429 and Volume 3, PB-212 431.

Descriptors: (*Public utilities, *Regional planning), (*Mississippi, Regional planning), (*Sanitary engineering, Regional planning), (*Water treatment, Regional planning), Sewage treatment, Sanitary engineering, Forecasting, Recommendations, Water supply.
Identifiers: Hancock County (Mississippi), Harrison County (Mississippi), Jackson County (Mississippi), Pearl County (Mississippi), *Solid waste disposal.

The report includes an inventory and analysis of existing waterworks and sanitary sewerage systems in the four county Mississippi Gulf Region and long range plans for interconnecting these facilities into regional and subregional urban systems. The water and sewerage plans also include forecasts of future urban needs and recommendations for strengthening, extending and expanding existing facilities to serve these needs. (Author)

PB-212 431 PC$13.75/MF$0.95
Diversified Consultants, Inc., Jackson, Miss.
URBAN SYSTEMS ENGINEERING DEMONSTRATION PROGRAM. VOLUME III: AREA-WIDE SOLID WASTE MANAGEMENT FOR WATERWORKS, SANITARY SEWERAGE, SOLID WASTE MANAGEMENT, STORM DRAINAGE AND FLOOD PLAIN MANAGEMENT,
James A. Elliott, Ralph L. Waters, and A. Paul Desmarais. 1972, 235p DCI-69-56-03
Prepared in cooperation with Gulf Regional Planning Commission, Gulfport, Miss. Sponsored in part by Department of Housing and Urban Development, Jackson, Miss. See also Volume 2, PB-212 430, and Volume 4, PB-212 432.

Descriptors: (*Regional planning, *Public utilities), (*Mississippi, Regional planning), (*Waste disposal, Regional planning), Design, Inventories, Refuse disposal, Collecting methods, Earthfills, Management, Regulations.
Identifiers: *Solid waste disposal, Hancock County (Mississippi), Harrison County (Mississippi), Jackson County (Mississippi), Pearl County (Mississippi), Sanitary landfills.

The report presents an inventory and analysis of existing solid waste disposal facilities; recommendations for effective solid waste management and a solid waste development plan to the year 1990. (Author)

PB-212 432 PC$10.75/MF$0.95
Diversified Consultants, Inc., Jackson, Miss.
URBAN SYSTEMS ENGINEERING DEMONSTRATION PROGRAM. VOLUME IV: AREA-WIDE STORM DRAINAGE AND FLOOD PLAIN MANAGEMENT, FOR WATERWORKS, SANITARY SEWERAGE, SOLID WASTE MANAGEMENT, STORM DRAINAGE AND FLOOD PLAIN MANAGEMEN T,
James A. Elliott, Ralph L. Waters, and A. Paul Desmarais. 1972, 173p DCI-69-56-04
Prepared in cooperation with Gulf Regional Planning Commission, Gulfport, Miss. Sponsored in part by Department of Housing and Urban Development, Jackson, Miss. See also Volume 3, PB-212 431.

Descriptors: (*Regional planning, *Public utilities), (*Mississippi, Regional planning), (*Storm sewers, Regional planning), (*Flood plain zoning, Regional planning), Flood control, Management, Inventories, Recommendations, Regulations.
Identifiers: Hancock County (Mississippi), Harrison County (Mississippi), Jackson County (Mississippi), Pearl County (Mississippi).

The report presents long-range plans for flood plain management and storm drainage improvements in the four-county Mississippi Gulf Region. (Author)

PB-212 434 PC$8.50/MF$0.95
Ware, Lewis and Eaton, Jackson, Miss.
COMMUNITY GOALS, OBJECTIVES AND STANDARDS - INITIAL HOUSING STUDY - NEIGHBORHOOD ANALYSIS, RAYMOND, MISSISSIPPI.
Final rept.
Apr 72, 130p WLE-RAY-72-01
Prepared in cooperation with City of Raymond, Miss. See also PB-212 435.

Descriptors: (*Urban planning, *Mississippi), Community development, Neighborhoods, Pro-

ject planning, Objectives, Standards, Residential buildings, Regional planning.
Identifiers: Initial housing element, *Raymond (Mississippi).

Included in Volume 1 of the Raymond comprehensive plan and community goals, objectives and standards, neighborhood analysis and initial housing study for the town of Raymond, Mississippi and a contiguous peripheral area of one mile outside of the town's corporate limits.

PB-212 435 PC$11.25/MF$0.95
Ware, Lewis and Eaton, Jackson, Miss.
THE PARKING AND COMMERCIAL AREA SKETCH PLAN - LAND USE PLAN - COMMUNITY FACILITIES PLAN - WATER AND SEWERAGE PLAN - THOROUGHFARE AND STREET PLAN - PUBLIC IMPROVEMENTS PROGRAM, RAYMOND, MISS.
Final rept.
Apr 72, 183p WLE-RAY-72-02
Prepared in cooperation with the Town of Raymond, Miss. See also PB-212 434.

Descriptors: (*Urban planning, *Mississippi), Parking facilities, Central city, Water services, Sewers, Streets, Public works, Project planning.
Identifiers: Community facilities, Thoroughfares, *Raymond (Mississippi).

Included in Volume 2 of the Raymond comprehensive plan are the thoroughfare and street plan, the community facilities plan, the water and sewerage plan, the parking and commercial area sketch plan, the land use plan, and the public improvements program for the town of Raymond, Mississippi and a contiguous peripheral area of one mile outside of the town's corporate limits.

PB-212 436 PC$6.75/MF$0.95
Ware, Lewis and Eaton, Jackson, Miss.
COMMERCIAL AREA STUDY AND COMMUNITY APPEARANCE PLAN FOR PASCAGOULA, MISS.
Final rept.
Apr 72, 91p WLE-PG-72-02
Prepared in cooperation with the Pascagoula Planning Commission, Miss. See also PB-212 437.

Descriptors: (*Urban planning, *Mississippi), Central city, Commerce, Economic surveys, Community development, Project planning, Environmental surveys.
Identifiers: *Pascagoula (Mississippi).

The reports provide an overview of Pascagoula's environmental appearance and commercial areas. The community appearance plan includes perspective sketches, recommendations, and costs of proposed projects. The commercial area study delineates existing commercial areas; their interrelationships and the effect of surrounding area commercial development; existing and proposed traffic circulation patterns, existing and proposed future land uses, and recommendations for remedial actions.

PB-212 437 PC$6.75/MF$0.95
Ware, Lewis and Eaton, Jackson, Miss.
COMMERCIAL AREA STUDY AND COMMUNITY APPEARANCE PLAN FOR JACKSON COUNTY, MISS.
Final rept.
Apr 72, 92p WLE-JC-72-02
Prepared in cooperation with the Jackson County Planning Commission, Pascagoula, Miss. See also PB-212 436.

Descriptors: (*Regional planning, *Mississippi), Environmental surveys, Community development, Project planning, Cost engineering, Recommendations, Central city, Commerce, Land use, Traffic.
Identifiers: *Jackson County (Mississippi).

The reports provide an overview of Jackson County's environmental appearance and commercial areas. The community appearance plan includes perspective sketches, recommendations and costs of proposed projects. The commercial area study delineates existing and future concentrations of commercial areas; their interrelationships, existing and proposed traffic circulation patterns, existing and proposed future land uses, and recommendations for remedial actions.

PB-212 438 PC$12.00/MF$0.95
Escambia-Santa Rosa Regional Planning Council, Pensacola, Fla.
SHORELINE MANAGEMENT PLAN FOR THE ESCAMBIA-SANTA ROSA REGION.
Final rept.
Jun 72, 197p ESRRPC-72-04
Prepared in cooperation with Milo Smith and Associates, Tampa, Fla.

Descriptors: (*Coasts, Management), (*Regional planning, *Florida), Environmental surveys, Land use, Design standards, Project planning, Economic development.
Identifiers: *Escambia (Florida), *Santa Rosa (Florida).

The Shoreline Management Plan is divided into six basic parts: (1) Environmental impact of major land use classes; (2) Analysis of coastal environment; (3) Regional design analysis; (4) Existing development patterns; (5) Shoreline development plan; and (6) the Management program. Combined, these parts make up a comprehensive policy statement and implementation program geared to optimum ling-range use of the coastal zone.

PB-212 442 PC$3.00/MF$0.95
Transport and Road Research Lab., Crowthorne (England).
SOME EFFECTS OF LOADING HISTORY ON THE FATIGUE PERFORMANCE OF ROLLED ASPHALT,
K. D. Raithby, and A. B. Sterling. 1972, 32p
TRRL-LR-496

Descriptors: (*Flexible pavements, Fatigue (Materials)), Asphalts, Loads (Forces), Fatigue tests, Great Britain.

Results are given of fatigue tests under direct stress axial loading conditions on a typical rolled asphalt base-course material, to investigate the significance of varying the load-time history. Rest periods between successive loading cycles had a beneficial effect on fatigue performance, both by increasing the resistance to cracking and by reducing the rate of loss of dynamic stiffness due to repeated loading. Rest periods of the order of 1s increased the number of cycles to failure by a factor of up to 25, when compared with the life under continuous sinusoidal cyclic loading. The improvement in life was less at high temperatures; it also appeared to be affected somewhat by the magnitude of the applied cyclic stress, although this effect was not clearly established. (Author)

PB-212 448 PC$3.00/MF$0.95
Transport and Road Research Lab., Crowthorne (England).
SOIL STABILIZATION IN AFRICA,
J. N. Bulman. 1972, 15p TRRL-LR-476

Descriptors: (*Pavements, Soil stabilization), (*Soil stabilization, Africa), Pavement bases, Soil cement, Thickness, Calcium oxides, Failure, Structural design, Bearing strength, Great Britain.

Excellent and cheap roads have been built in many parts of Africa using stabilized soil for the base and surface-dressings for the running surface. The most commonly used stabilizing agent is cement, but some countries have employed lime stabilization to great advantage. Research is being carried out at the Transport and Road Research Laboratory into the physical properties of stabilized soil with the object of enabling the cracking of stabilized soil pavements, which is sometimes a problem, to be better controlled. Improved strength criteria based on tensile strength are also being sought. (Author)

PB-212 450 PC$9.00/MF$0.95
South Carolina Administration Div., Columbia.
COMMERCIAL AREAS STUDY: CITY OF ANDERSON, SOUTH CAROLINA.
May 72, 137p SC-40-0014-0510
Prepared in cooperation with the LBC and W Associates, Columbia, S.C., and Anderson Planning and Zoning Commission, S.C.

Descriptors: (*Urban planning, *South Carolina), (*Central city, Economic analysis), Commerce, Objectives, Land use.
Identifiers: *Anderson (South Carolina).

The report contains the Commercial Areas Plan for the City of Anderson. Each of the major commercial areas was analyzed from the standpoint of its ability to meet the current needs of the consumer, its overall economic viability, and its projected ability to meet the competition of other commercial areas, both within the city and in the immediate region. Emphasis was placed on the revitalization of the Central Business District in development of the plan. Three alternatives were presented, one of which was selected and scheduled for implementation during the next five to six years. (Author)

PB-212 451 PC$6.00/MF$0.95
Mid-East Commission, Washington, N.C.
UPDATED OVERALL PROGRAM DESIGN.
Jun 72, 80p MEC-72-06

Descriptors: (*Regional planning, *North Carolina), (*Economic development, Regional planning), Project planning, Cost estimates, Manpower, Income, Population growth, Industries, Public utilities, Capital, Local government, Residential buildings, Houses, Trailers, Sites.

The report provides an overview of the problems and needs of the five-county Mid-East Economic Development District. Sources of information derived and priorities established resulted from a series of questionnaires and meetings with local officials and citizens. From these priorities a three-year work program was established for planning the solutions to some of the Regional problems. This report includes the goals of this Region, the organizational arrangements and functions; a three-year work program, (plans, programs and projects); scheduling cost estimates for each year by program, anticipated income, and effective methods of coordination. (Author)

PB-212 452 PC$3.25/MF$0.95
Tri-State Regional Planning Commission, New York.
ANNUAL REGIONAL REPORT, 1972,
Lyman B. Coddington. Jul 72, 25p TSRPC-3028-3704-5M

Descriptors: (*Regional planning, New York), Connecticut, New Jersey, Economic surveys, Demographic surveys, Residential buildings, Transportation.
Identifiers: Tri State Planning Commission, New York City metropolitan area, Economic indicators.

The 1972 annual report of the Tri-State Regional Planning Commission briefly outlines important month-by-month activities in the New York City metropolitan area. In addition, measurements of change and growth for the years 1960 thru 1971 are given for such regional indices as employment, population, personal income, housing starts, movement of freight in tonnage, among others. A growing planning partnership among the federal,

state and local governments in the areas of highways, mass transit, housing, sewerage, and water supply is discussed.

PB-212 454 PC$6.00/MF$0.95
Escambia-Santa Rosa Regional Planning Council, Pensacola, Fla.
PENSACOLA BEACH LAND MANAGEMENT PLAN.
Final rept.
Jun 72, 80p ESRRPC-72-05
Prepared in cooperation with Milo Smith and Associates, Tampa, Fla.

Descriptors: (*Regional planning, *Florida), (*Beaches, Regional planning), Recreational facilities, Landscaping, Management, Standards, Building codes, Land use, Development.
Identifiers: *Escambia County (Florida), *Santa Rosa County (Florida), *Pensacoa Beach.

The Pensacola Beach Land Management Plan presents strategies for management of the limited land resources of Pensacola Beach. These strategies include proposals for development action and development control. Together they provide a comprehensive program for the implementation of a development scheme which would facilitate the attainment of local and regional development objectives. Problems and potentials relating to development on Pensacola Beach are identified and discussed. Based on the development issues identified and on the physical, economic and locational characteristics of the area, a general development pattern is proposed. (Author)

PB-212 456 PC$3.00/MF$0.95
Parsons Brinckerhoff-Tudor-Bechtel, San Francisco, Calif.
SAN FRANCISCO AIRPORT ACCESS PROJECT.
Summary rept.
May 72, 40p UMTA-CA-09-0012-72-1
Contract DOT-UT-262
Prepared in cooperation with Wilbur Smith and Associates, and Kirker, Chapman, Consultants.

Descriptors: (*Rapid transit railroads, Urban transportation), (*Airports, Access roads), Feasibility, Reviews.
Identifiers: *Airport access systems, *BART (Bay Area Rapid Transit), San Mateo County (California), Rapid transit systems, *San Francisco (California).

The report summarizes an earlier study of the feasibility of extending the Bay Area Rapid Transit (BART) system to serve San Francisco International Airport. This summary was prepared to answer several basic questions about the proposed BART extensions: (1) How can such transit help. (2) How soon is it needed. (3) What will it be like. (4) How might the cost be shared. (5) Will it be built. A proposed route description and various financing alternatives are discussed.

PB-212 458 PC$3.00/MF$0.95
Institute for Defense Analyses, Arlington, Va. Urban Mass Transportation Project.
CONCEPTS FOR EVALUATING CENTER CITY TRANSPORTATION PROGRAM AND PROJECTS.
Interim rept.,
Murray Kamrass, Jane-Ring Crane, Paul Hughes, and Elizabeth Parker. Dec 69, 77p S-353 UMTA-TRD-51-69-3, IDA/HQ-69-10656
Contracts DAHC15-67-C-0011, DOT-UT-43 (IAA)

Descriptors: (*Central city, *Urban transportation), Project planning, Objectives, Benefit cost analysis, Feasibility.
Identifiers: Center city project.

A general approach to evaluating projects under the Center City Program is outlined and discussed. Components of the overall program are projects being conducted in groups of five, eight, and twenty-one cities by various contractors of the Urban Mass Transportation Administration. Each project is described briefly. The approach to evaluation methodology described in this report involves the application of benefit-cost analysis to determine the impact of center city transportation improvements on various institutions and groups.

PB-212 459 PC$3.00/MF$0.95
Institute for Defense Analyses, Arlington, Va. Urban Mass Transportation Project.
FACTORS FOR EVALUATION OF CENTER CITY TRANSPORTATION PLANS.
Final rept.,
Murray Kamrass. Apr 70, 67p UMTA-TRD-51-69-4, IDA/HQ-69-10348/2
Contract DAHC15-67-C-0011, DOT-UT-43 (IAA)
Revision of report dated Aug 69.

Descriptors: (*Urban transportation, Community relations), (*Passenger transportation, Economic analysis), Economic surveys, Benefit cost analysis, Industrial relations, Central city, Consumers, Environmental surveys, Demography, Noise (Sound), Air pollution, Safety, Human factors engineering, Computer programming, Travel time.

The report describes 13 factors or attributes of an urban transportation system which must be considered in a benefit-cost evaluation of transportation impacts on four groups of potential beneficiaries: users, business and real estate interests, persons residing in proximity to rights-of-way, and the general community. The report was prepared as a supplement to Concepts for Evaluating Center City Transportation Program and Projects which discussed a general methodological approach. A comprehensive benefit-cost model must identify the distribution of transportation benefits and costs among the four groups. Specific factors to be considered include: travel time, access, noise, safety, vibration, air pollution, economic efficiency, growth and development, emergency responses, comfort and amenities, intrusion, attractiveness for the commuter, and flexibility.

PB-212 467 PC$6.25/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
ZONING AND SUBDIVISION REGULATIONS, 1972. CRANE, MISSOURI.
Final rept.
Jun 72, 84p MOCOM-PLN-72-0026

Descriptors: (*Urban planning, *Missouri), (*Land use zoning, Ordinances), Regulations, Boundaries, Residential buildings, Commercial buildings, Industrial buildings, Standards, Parking facilities.
Identifiers: *Crane (Missouri).

In order that a city planning program becomes a reality there must be land use controls. The regulations contained within this document are the most commonly used to control the future development and use of land. These proposed ordinances are a Zoning Ordinance and Subdivision Regulations. The Zoning Ordinance divides the city into districts in order to control and regulate the following: land use, density, setback, parking and loading, and lot size. Examples of major districts in the city are residential, commercial, and industrial. The Subdivision Regulations prescribe the minimum standards and procedures which must be satisfied befor raw land can be subdivided and sold. (Author)

PB-212 472 PC$12.00/MF$0.95
South Carolina Administration Div., Columbia.
1972 NATIONAL TRANSPORTATION NEEDS STUDY. SOUTH CAROLINA.
Jun 72, 199p SC-40-0014-0554

Descriptors: (*Transportation, *South Carolina), Urban transportation, Intrastate transportation, Economic forecasting, Capitalized costs, Transportation management, Budgeting, Cost engineering.
Identifiers: Transportation needs, Capital improvements programs, *Transportation planning.

In the 1972 Transportation Needs Study TOT funds were used to carry out the technical work while HUD 701 funds were coordinated to perform the summary and planning evaluation work. This report is an extensive review of the Needs Study. It explains the technical steps used to develop the needs estimate capital budget program. In addition, it analyzes thoroughly the transportation planning process in the State and makes specific recommendations for its improvement. (Author)

PB-212 473 PC$3.00/MF$0.95
Urban Mass Transportation Administration, Washington, D. C.
URBAN MASS TRANSPORTATION ADMINISTRATION (U.M.T.A.) TRANSPORTATION PLANNING SYSTEM -- REFERENCE MANUAL.
15 Sep 72, 253p UMTA-RDD-72-1
See also PB-212 474.

Descriptors: (*Transportation management, Urban planning), (*Urban planning, *Mass transportation), Intrastate transportation, Network analysis (Management), Network flows, Transportation models, Queueing theory, Trees (Mathematics), Programming languages.
Identifiers: UMTA (Urban Mass Transportation Administration), Urban mass transportation administration, JCL (Job Controlled Language), Job controlled language, JCL programming language.

The UMTA Transportation Planning System (UTPS) is a collection of IBM System/360 computer programs for use in planning multimodal transportation systems. The objective of UTPS is to provide readily available, easy-to-use and fully tested planning tools for transportation planners attempting to solve a wide variety of problems. UTPS presently consists of 14 separate computer programs designed for use in the IBM 360 operating system. This document, the reference manual, summarizes information pertaining to the operation of the UTPS programs. It is intended to be used as a concise reference for persons already familiar with the usage of the programs. Specific sections include statements of system controls, subject program controls, program writeup organization, software system description, catalogued procedures, and actual program writeups. (Author)

PB-212 474 PC$3.00/MF$0.95
Urban Mass Transportation Administration, Washington, D.C.
URBAN MASS TRANSPORTATION ADMINISTRATION (U.M.T.A.) TRANSPORTATION PLANNING SYSTEM -- NETWORK DEVELOPMENT MANUAL.
15 Sep 72, 79p UMTA-RDD-72-2
See also PB-212 473.

Descriptors: (*Transportation management, Urban planning), (*Urban planning, *Mass transportation), Intrastate transportation, Network analysis (Management), Network flows, Transportation models, Queueing theory, Trees (Mathematics).
Identifiers: UMTA (Urban Mass Transportation Administration), Urban mass transportation administration.

The UMTA Transportation Planning System (UTPS) is a set of computer programs for use in planning multi-modal transportation systems. The basic UTPS software is aimed at the mid-level of analysis -- ie. specific routes and corridors as have been used for typical areawide transportation planning studies. One critical elements of these analyses is the ability to accurately represent existing and planned transportation systems. This

manual provides an overview of the UTPS network analysis computer programs which are designed to simulate such urban transportation systems. Specific topics covered in this report include: network functions and components, the actual transit planning programs, preparation of network data and maps, problem situations and solutions, and a discussion of specialized networks. Parameters for the various programs are covered in the appendices. (Author)

PB-212 478 PC$3.00/MF$0.95
Research Triangle Inst., Durham, N.C.
A STUDY OF CORRELATIONS OF OZONE AND SULFUR DIOXIDE.
Final rept.,
L. F. Ballard, and L. K. Matus. Sep 72, 16p RTI-41U-98-93 EPA-R3-72-013
Contract EPA-68-02-0257

Descriptors: (*Air pollution, *Sulfur dioxide), (*Ozone, Air pollution), Correlation, Tables (Data), Urban areas, Linear regression, Diurnal variations, Missouri, California, Concentration (Composition).
Identifiers: Air quality data, Saint Louis (Missouri), Los Angeles (California).

The report describes the results of a data analysis study to determine the correlation between ozone (O3) and sulfur dioxide (SO2) concentrations in ambient air using data that had been obtained in Los Angeles and St. Louis. Sulfur dioxide concentrations were determined by the flame photometer detector method. Ozone concentrations were determined by the chemiluminescent reaction between ozone and ethylene. Not having an established gas phase reaction model as a basis for relating SO2 and O3 in this study, a series of simple linear regressions were performed to test or determine the significance of a relationship if it exists. Data sets consisted of hourly averages obtained at the same time each day. (Author)

PB-212 480 PC$12.25/MF$0.95
Los Angeles County Regional Planning Commission, Calif.
PRELIMINARY HOUSING ELEMENT.
Feb 72, 201p HUD-CIR-367-02

Descriptors: (*Residential buildings, Regional planning), (*Regional planning, California), Deterioration, Supply (Economics), Quality, Demand (Economics), Age, Income, Improvement, Values, Policies, Local government.
Identifiers: *Los Angeles County (California).

A wide array of housing problems were covered in this report, emphasizing the human impacts. Most important among these is the question of how to increase the housing supply at a pace which will reverse the present trend toward an increasing shortage. The approach called for by this report is a program of collaborative effort by many organizations-city and county governments, community groups and housing producers-aimed at increasing production on an accelerating basis, in line with priorities of need, until the shortage is overtaken. (Author)

PB-212 483 PC$5.25/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
ZONING ORDINANCE AND SUBDIVISION REGULATIONS FOR GALLATIN, MISSOURI.
Final rept.
Jun 72, 62p MOCOM-PLN-72-0038

Descriptors: (*Urban planning, *Missouri), (*Land use zoning, Ordinances), Regulations, Boundaries, Standards, Residential buildings, Commercial buildings, Industrial buildings, Parking facilities.
Identifiers: *Gallatin (Missouri).

In order that a city planning program becomes a reality there must be land use controls. The regulations contained within this document are the most commonly used to control the future development and use of land. These proposed ordinances are a Zoning Ordinance and Subdivision Regulations for Gallatin, Missouri. The Zoning Ordinance divides the city into districts in order to control and regulate the following: land use, density, setback, parking and loading, and lot size. Examples of major districts in the city are residential, commercial, and industrial. The Subdivision Regulations prescribe the minimum standards and procedures which must be satisfied before raw land can be subdivided and sold. (Author)

PB-212 489 PC$11.50/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
COMPREHENSIVE PLAN FOR BONNE TERRE, MISSOURI.
Final rept.
Jun 72, 189p MOCOM-PLN-72-0016

Descriptors: (*Urban planning, *Missouri), Land use, Population growth, Economic development, Objectives, Residential buildings, Parks, Streets, Public utilities, Parks, Industries, Finance, Standards, Central city.
Identifiers: *Bonne Terre (Missouri).

The Comprehensive Plan for Bonne Terre presents an analysis of data relating to urban development within its environs and surrounding areas of influence for the next twenty years. Background studies analyze the following areas: existing land use, population, economy, and housing. The final product of the previous analysis is the Comprehensive Plan which is made up of the following major components: Community Facilities Plan, Park Plan, Major Thoroughfare Plan, and Future Land Use Plan. (Author)

PB-212 490 PC$9.75/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
COMPREHENSIVE PLAN FOR COLE CAMP, MISSOURI.
Final rept.
Jun 72, 153p MOCOM-PLN-72-0035

Descriptors: (*Urban planning, *Missouri), Population growth, Land use, Economic development, Streets, Community development, Public utilities, Parks, Objectives, Ordinances, Residential buildings, Central city, Maps.
Identifiers: *Cole Camp (Missouri).

The City of Cole Camp has experienced a steady population growth during the past years and this trend is expected to continue in the future. In order that this growth is the most orderly and beneficial for the community, this Comprehensive Plan has been developed. Within this Plan are background studies which analyze the following areas: existing land use, population, economy, and housing. The final product of the previous analyses is a Comprehensive Plan which is made up of the following major components: Future Land Use Plan, Major Street Plan, Community Facilities Plan, and Park Plan. (Author)

PB-212 492 PC$5.00/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
SURVEY OF HOUSING IN THE NORTHWEST MISSOURI REGION.
Final rept.
Jun 72, 58p MOCOM-PLN-72-0013

Descriptors: (*Residential buildings, Regional planning), (*Regional planning, *Missouri), Values, Population growth, Economic analysis, Income, Surveys, Tables (Data), Standards, Quality.

The report contains a survey of housing in the Northwest Missouri Region and details information on housing value, quantity, substandard units, density and overcrowding, and other indicators of housing quality. The report also delineates some of the housing problems in the region and contains a discussion of possible solutions to these problems. (Author)

PB-212 497 PC$3.00/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
MISSOURI PLANNER-IN-CHARGE REQUIREMENTS.
Final rept.
Jan 72, 13p MOCOM-PLN-72-0003

Descriptors: (*Regional planning, *Missouri), Grants, Executives, Organizing, Project planning, Manuals.

The purpose and intent of the publication is to set forth the standards and procedures for the state of Missouri by which planner-in-charge status may be conferred upon qualified individuals who desire to conduct comprehensive planning work in the state utilizing planning assistance funds from the Department of Housing and Urban Development.

PB-212 498 PC$3.00/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
GOALS AND OBJECTIVES OF THE NORTHWEST MISSOURI REGIONAL PLANNING COMMISSION.
Final rept.
Jun 72, 20p MOCOM-PLN-72-0011

Descriptors: (*Regional planning, *Missouri), Project planning, Objectives, Management engineering, Methodology, Classifications, Information systems.
Identifiers: Northwest Missouri planning commission.

The report contains the achievement plans for the Northwest Missouri Region and a listing and ranking of objectives that are the responsibility of the Northwest Missouri Regional Planning Commission.

PB-212 499 PC$4.00/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
OVERALL PROGRAM DESIGN AND ANNUAL WORK PROGRAM FOR THE NORTHWEST MISSOURI REGIONAL PLANNING COMMISSION.
Final rept.
Jun 72, 40p MOCOM-PLN-72-0012

Descriptors: (*Regional planning, *Missouri), Financing, Project planning, Operations, Reviews, Management, Organizations, Economic analysis.
Identifiers: *Northwest Missouri.

In order for a Regional Planning Commission to prepare a regional comprehensive plan, the Commission needs to know the best route to take that will utilize resources to the highest degree. This document outlines needs for specified amounts of money in the next four years to develop a comprehensive plan. The document also contains a detailed breakdown of the Commission's 1973 annual work program.

PB-212 501 PC$5.25/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
HAZELWOOD ORDINANCE REVIEW AND RECOMMENDED ADDITIONS AND MODIFICATIONS - 1972.
Final rept.
Jun 72, 64p MOCOM-PLN-72-0015

Descriptors: (*Urban planning, *Missouri), (*Land use zoning, Ordinances), Reviews, Regulations, Boundaries, Streets, Residential buildings, Commerce, Industries, Agriculture, Public utilities.
Identifiers: *Hazelwood (Missouri).

Based on a Comprehensive Plan completed for the City of Hazelwood in Fiscal Year 1971-72, the existing implementation ordinances of the city are reviewed as to applicability and suitability. Specifically, the subdivision regulations and zoning ordinance were reviewed. Recommended additions and modifications are presented. In addition, guidelines for the proper operation of the City Board of Adjustment and a sample sign ordinance are included for municipal reference. (Author)

PB-212 511 PC$6.00/MF$0.95
Southwest New Mexico Council of Governments, Silver City.
INITIAL OVERALL PROGRAM DESIGN.
Aug 72, 78p SWNMCOG-02 CPA-NM-1001-NMP/4-2
Prepared in cooperation with New Mexico State Planning Office and Department of Housing and Urban Development.

Descriptors: (*Regional planning, *New Mexico), Project planning, Objectives, Organizations, Local government, Maps, Land use, Soils, Water supply, Sewage, Parks, Industries, Employment, Residential buildings, Budgets, Transportation, Public utilities, Services.
Identifiers: *Luna County (New Mexico), *Grant County (New Mexico), *Hidalgo County (New Mexico), *Catron County (New Mexico).

The report is the initial Overall Program Design for the implementation of the planning process, and the furnishing of technical assistance for the accomplishment of the objectives planned by the Southwest New Mexico Council of Governments. It covers all of the municipalities and the county governments in the Counties of Luna, Grant, Hidalgo and Catron in Southwest New Mexico. Imput of the Southwest New Mexico Resource Conservation Development Council and several of the Soil and Water Conservation Districts in the area is also included. (Author)

PB-212 512 PC$3.00/MF$0.95
Southwest New Mexico Council of Governments, Silver City.
PRELIMINARY GOALS AND OBJECTIVES OF THE SOUTHWEST NEW MEXICO COUNCIL OF GOVERNMENTS.
Apr 72, 10p SWNMCOG-01 CPA-NM-1001-NMP/4-1
Prepared in cooperation with New Mexico State Planning Office and Department of Housing and Urban Development.

Descriptors: (*Regional planning, *New Mexico), Local government, Project planning, Objectives, Standards, Residential buildings, Land use, Transportation, Economic development.
Identifiers: *Luna County (New Mexico), *Grant County (New Mexico), *Hidalgo County (New Mexico), Catron County (New Mexico).

The report is a preliminary statement of the Goals and Objectives of the Councils of Governments representing the county and municipal governments of the four southwest counties in the state of New Mexico. It briefly outlines the programs to be planned and developed by this COG in its next work program. Emphasis has been placed on positive planning for the improvement of the quality of living and standard of housing in the poverty areas of Grant, Luna, Hidalgo, and Catron counties of New Mexico. (Author)

PB-212 513 PC$10.25/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
GREEN HILLS REGIONAL OUTDOOR RECREATION PLAN FOR PARKS AND OPEN SPACE.
Final rept.
Jun 71, 164p MOCOM-PLN-72-0005

Descriptors: (*Recreational facilities, Regional planning), (*Regional planning, *Missouri), Project planning, Parks, Forecasting, Surveys, Human factors engineering.
Identifiers: Open space studies, *Outdoor recreation, *Green Hills region (Missouri), Counties.

The Green Hills region contains outdoor recreation areas for which new projects and developments are planned for the future. A plan has been initiated to insure orderly and systematic growth of these developments. Many segments of the region's characteristics have been studied, such as population, natural resources, and inventories of existing and potential sites. The end product of this effort is the Regional Plan complete with a capital improvements plan of action.

PB-212 514 PC$5.00/MF$0.95
Escambia Santa Rosa Regional Planning Council, Pensacola, Fla.
CONSTRUCTION CODE STUDY, PENSACOLA, SMSA.
Final rept.
Jun 72, 57p ESRRPC-72-02

Descriptors: (*Regional planning, *Florida), (*Building codes, Regional planning), Construction, Plumbing, Electricity, Natural gas, Residential buildings, Standards, Fees.
Identifiers: *Escambia County (Florida), *Santa Rosa County (Florida).

The report is concerned with the presence and status of uniform construction codes in the Pensacola SMSA. It identifies which codes are enforced by each government entity and the recency of that code. Model application and permit formats are included. Emphasis is placed upon the adoption of the latest edition of the Southern Building Code Congress Building, Plumbing, Gas, and Minimum Housing Code and the 1971 edition of the National Electrical Code. The report recommends that a Board of Appeals be created for each county to meet in an annual joint session. (Author)

PB-212 515 PC$6.00/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
ZONING ORDINANCE AND SUBDIVISION REGULATIONS FOR BONNE TERRE, MISSOURI.
Final rept.
Jun 72, 79p MOCOM-PLN-72-0017

Descriptors: (*Urban planning, *Missouri), (*Land use zoning, Ordinances), Regulations, Boundaries, Residential buildings, Commercial buildings, Industrial buildings, Building codes, Standards, Parking facilities, Law enforcement.
Identifiers: *Bonne Terre (Missouri).

In order that a city planning program becomes a reality there must be land use controls. The regulations contained with this document are the most commonly used to control the future development and use of land. These proposed ordinances are a Zoning Ordinance and Subdivision Regulations. The Zoning Ordinance divides the city into districts in order to control and regulate the following: Land use, density, setback, parking and loading, and lot size. Examples of major districts in the city are residential, commercial, and industrial. (Author)

PB-212 516 PC$6.25/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
ZONING ORDINANCE AND SUBDIVISION REGULATIONS FOR CASSVILLE, MISSOURI.
Final rept.
Jun 72, 81p MOCOM-PLN-72-0040

Descriptors: (*Urban planning, *Missouri), (*Land use zoning, Ordinances), Regulations, Boundaries, Residential buildings, Commercial buildings, Industrial buildings, Building codes, Penalties, Standards, Parking facilities.
Identifiers: *Cassville (Missouri).

In order that a city planning program becomes a reality there must be land use controls. The regulations contained within this document are the most commonly used to control the future development and use of land. These proposed ordinances are a Zoning Ordinance and Subdivision Regulations. The Zoning Ordinance divides the city into districts in order to control and regulate the following: land use, depsity, setback, parking and loading, and lot size. Examples of major districts in the city are residential, commercial, and industrial. (Author)

PB-212 518 PC$10.00/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
COMPREHENSIVE PLAN FOR GRANT CITY, MISSOURI.
Final rept.
Jun 72, 157p MOCOM-PLN-72-0009

Descriptors: (*Urban planning, *Missouri), Project planning, Economic surveys, Demography, Forecasting, Inventories, Ordinances.
Identifiers: *Grant City (Missouri).

In order that the growth and development of Grant City is orderly and beneficial for the community, a comprehensive plan was developed. The report includes a discussion of the planning process; an inventory of existing conditions including soils, climate, geography, geology, land use, housing, the economy, public services and facilities; projections of population, the economy, land use, housing, and public services and facilities; an analysis of deficient conditions; a future land use proposal; and an implementation section including a capital improvements program, an annexation program, a zoning ordinance, and a subdivision regulation. (Author)

PB-212 519 PC$12.50/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
COMPREHENSIVE PLAN FOR WAYNESVILLE AND ST. ROBERT, MISSOURI.
Final rept.
Jun 72, 210p MOCOM-PLN-72-0020

Descriptors: (*Urban planning, *Missouri), Population growth, Economic development, Land use, Residential buildings, Urban transportation, Parks, Streets, Ordinances, Standards, Public utilities, Services.
Identifiers: *Waynesville (Missouri), *Saint Robert (Missouri).

The Plan presents background studies which analyze the following areas: population, economy, existing land use, housing, transportation, and community facilities. The final product of the previously mentioned analyses is a coordinated development plan for both Waynesville and St. Robert. The Comprehensive Plan is made up of the following major components for both cities: Initial Housing Element, Community Facilities Plan, Park Plan, Major Thoroughfare Plan, and Future Land Use Plan. (Author)

PB-212 520 PC$9.50/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
COMPREHENSIVE PLAN FOR GALLATIN, MISSOURI.
Final rept.
Feb 72, 148p MOCOM-PLN-0037

Descriptors: (*Urban planning, *Missouri), Land use, Population growth, Economic development, Residential buildings, Central city, Streets, Parks, Ordinances, Regulations, Building codes.
Identifiers: *Gallatin (Missouri).

The City of Gallatin has experienced a steady population growth in the past and a continued growth is expected in the future. In order that this growth is most orderly and beneficial for the community, this comprehensive plan has been developed. Within this plan are background studies which analyze the following areas: existing land use, population, economy, and housing. The final product is a Comprehensive Plan which is comprised of the following components: Future Land Use Plan, Park Plan, Thoroughfare Plan, and Central Business District Recommendations. Also included as part of this project are the implementation tools which make it possible to enact a plan. These devices are a zoning ordinance, subdivision regulations, housing code, and a capital improvements program. (Author)

PB-212 522 PC$3.00/MF$0.95
Bureau of Reclamation, Denver, Colo. Engineering and Research Center.
HYDRAULIC MODEL STUDIES OF SCOGGINS DAM FISHTRAP AERATION AND SUPPLY STRUCTURE,
G. L. Beichley. Jul 72, 15p REC-ERC-72-27

Descriptors: (*Fishways, Aerators), (*Aerators, Structural design), Hydraulic models, Air entrainment, Valves, Oxygenation, Aeration, Flow measurement, Stilling basins, Tanks (Containers), Energy dissipation, Oregon.
Identifiers: Fishtrap aerators, Scroggins Dam.

Laboratory studies were made of the Scoggins Dam fishtrap aerator and supply structure with a 1:3.33 scale model to aid the development of the hydraulic design. A horizontally mounted fixed-cone valve discharging into a containment structure, followed by a stilling basin, was used to aerate the flow and to dissipate the flow energy before releasing it to the constant-head-orifice flow measurement structure. All of these features are part of the fishtrap supply structure. Results showed that the valve containment structure and stilling basin perform very well as an aerator and energy dissipator to provide quiet, oxygenated flow that could be measured and regulated in the constant-head-orifice structure. (Author)

PB-212 523 PC$3.00/MF$0.95
Colorado State Univ., Fort Collins. Dept. of Civil Engineering.
URBAN SIZE AND ITS RELATION TO NEED FOR AUTOMATION AND CONTROL,
Bruce H. Bradford, and Donald C. Taylor. Feb 72, 12p W73-00150, OWRR-C-2207 (6)
Contract DI-14-31-0001-3410

Descriptors: (*Combined sewers, Automatic control), (*Urban planning, Combined sewers), (*Sewers, Automatic control), Feasibility, Storm sewers, Terrain, Economic factors, Factor analysis, Management, Flow control, Computers, Sanitary engineering, Water pollution.
Identifiers: Water pollution control.

The urban parameters of 60 cities are examined in light of their relationship to the need or desire for urban water intelligence systems. A careful review of the economics and feasibility of an automated system as well as alternative systems is stressed for each situation. Incentives for automation, alternatives to an intelligence system and factors which affect the choice of alternatives are identified.

PB-212 527 PC$5.75/MF$0.95
Macon County Regional Plan Commission, Decatur, Ill.
THE DEVELOPMENT PLAN FOR MILAM TOWNSHIP, MACON COUNTY, ILLINOIS.
Final rept.
Jun 72, 74p MCRPC-72-19

Descriptors: (*Urban planning, *Illinois), (*Participative management, Urban planning), Land use, Residential buildings, Transportation, Industries, Public utilities.
Identifiers: *Milam Township (Illinois), *Macon County (Illinois).

A development plan based largely on growth agreements between various governmental agencies within the township suggests ordinances to enable the plan to be effectuated. The primary reason for planning on the township level is to increase citizen involvement in the planning process.

PB-212 528 PC$10.00/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
COMPREHENSIVE PLAN FOR ROCK HILL, MISSOURI.
Final rept.
Jun 72, 157p MOCOM-PLN-72-0006

Descriptors: (*Urban planning, *Missouri), Urbanization, Community development, Land use, Demography, Economic factors, Residential buildings, Transportation, Facilities, Forecasting, Public works.
Identifiers: *Rock Hill (Missouri).

The report is a comprehensive plan for the city of Rock Hill dealing with the physical development, redevelopment, and maintenance of an urbanized community within a metropolitan setting.

PB-212 529 PC$3.00/MF$0.95
Colorado State Univ., Fort Collins. Dept. of Civil Engineering.
METROPOLITAN WATER INTELLIGENCE SYSTEMS.
Completion rept. on Phase 1,
George L. Smith, Neil S. Grigg, L. Scott Tucker, and Duane W. Hill. Jun 72, 102p* W73-00154, OWRR-C-2207 (3410) (10)
Contract DI-14-31-0001-3410
See also PB-212 523, PB-212 569, PB-212 573 thru PB-212 577.

Descriptors: (*Urban planning, Combined sewers), (*Combined sewers, Automatic control), (*Sewers, Automatic control), Flow control, Computers, Sanitary engineering, Real time operations, Design, Urban planning, Systems engineering, Overflows, Water pollution, Storm sewers.
Identifiers: *Water pollution control.

The Metropolitan Water Intelligence System (MWIS) Concept is being developed with the objective of providing automatic operational control for metropolitan water systems. The initial study was an investigation into the specific problem of controlling overflows from combined sewer systems in order to reduce this source of receiving water pollution. The technical and nontechnical aspects of the problem discussed include: the initiation of a Real-Time Automation and Control System (RTACS) by means of a simulation model for use in the design of the components of the RTACS, the initial criteria for use in the development and operation of an RTACS, and the technical and nontechnical feasibility of an RTACS for combined sewer systems and possible further application to overall urban water systems.

PB-212 530 PC$3.00/MF$0.95
Stanford Research Inst., Menlo Park, Calif.
STUDY OF LASER BACKSCATTER BY PARTICULATES IN STACK EMISSIONS.
Final rept.,
Edward E. Uthe, and Charles E. Lapple. Jan 72, 158p EPA-R2-72-089
Contract CPA-70-173

Descriptors: (*Air pollution, *Optical radar), (*Detectors, *Particles), (*Smoke, Detectors), Chimneys, Plume detection, Fly ash, Optimization, Backscattering, Tests, Design criteria, Light scattering, Remote sensing, Particle size, Opacity, Reflectance, Concentration (Composition).
Identifiers: *Air pollution detection, Mie scattering.

The validity of determining smoke plume opacity or particulate content from measurements of the backscatter of laser radiation from plume particulates was investigated. The backscatter experiments were conducted with the use of a specially designed aerosol chamber that allowed the experimental geometry to simulate that associated with actual remote plume probing. Raw fly ash collected from a bituminous coal-burning power plant was classified into various size fractions and pneumatically injected into the chamber at controlled concentrations. The aerosol was continuously monitored by a white light transmissometer along the axis of the chamber. Lidar measurements were made to determine the backscatter and transmission of the generated aerosols. These results for fly ash indicate that plume opacity may be determined from lidar backscatter measurements at 0.7 microns wavelength, but that mass concentration is better inferred from 1.06 microns lidar backscatter measurements. (Author)

PB-212 534 PC$3.00/MF$0.95
North Carolina Water Resources Research Inst., Raleigh.
A COMPARATIVE STUDY OF STATE WATER POLLUTION CONTROL LAWS AND PROGRAMS,
Milton S. Heath, Jr. Jan 72, 279p* UNC-WRRI-72-42 W73-00142, OWRR-A-004-NC (4)

Descriptors: (*Water pollution, *Law (Jurisprudence)), (*Government policies, Water pollution), (*State government, Water pollution), Water law, Common law, Regulations, Comparison, North Carolina, Michigan, Maine, New York, Pennsylvania, Virginia, National government, Litigation, Management.
Identifiers: Water pollution abatement.

The study of the water pollution control programs of Maine, Michigan, New York, North Carolina, Pennsylvania, and Virginia reviews the evolution of water pollution control programs in general and those of the states in particular. It offers insights into the laws, policies, and institutional arrangements of the six states. Strengths and weaknesses of state programs are noted. A check list is included of some of the best features of state water quality management programs as reflected in the actual experience of the study states. Appendices include a summary of the literature, laws, and programs of particular states, the text of North Carolina's statutes and regulations, illustration of the use of 'citizen suits' in Pennsylvania, and responses from the individual states as to current progress. (Author)

PB-212 538 PC$3.00/MF$0.95
Computer Science Corp., Falls Church, Va.
GUIDE CRITERIA FOR THE EVALUATION OF: OPERATION BREAK-THROUGH. HOUSING SYSTEMS. VOLUME V. QUALITY ASSURANCE PROGRAM PROVISIONS.
1 Dec 70, 47p*
Contract HUD-H-1449
See also Volume 4, PB-212 058.

Descriptors: (*Residential buildings, *Quality assurance), (*Urban renewal, Residential buildings), Construction management, Performance evaluation, Design standards, Site surveys, Preparation, Verification inspection, Acceptable quality level, Engineering standards.
Identifiers: *Breakthrough operation, Industrialized housing, High rise apartment buildings, Low rise apartment buildings, Single family detached dwellings, Single family attached dwellings.

The report provides information and general guidelines for the development, implementation and management of quality assurance programs for housing system producers related to Operation BREAKTHROUGH. The provisions and guidelines contained in this document reflect an adaptation of quality assurance techniques currently being implemented by both government and industry. This document covers various aspects of the industrialized housing process from initiation of production planning, through procurement, manufacturing, transportation, and erection. These general guidelines provide the basis for selection of quality assurance procedures that are applicable to a particular housing system producer or principal supplier thereto. (Author)

PB-212 540 PC$3.00/MF$0.95
Washington Univ., Seattle. Urban Transportation Program.
PLANNING DEMAND-ADAPTIVE URBAN PUBLIC TRANSPORTATION SYSTEMS: THE MAN-COMPUTER INTERACTIVE GRAPHIC APPROACH.
Research rept.,
Matthias Hans Rapp. Jun 72, 220p* RR-71-4
UMTA-URT-3- (71)-4
Contract UMTA-URT-3-71

Descriptors: (*Urban transportation, *Adaptive systems), (*Bus lines, *Transportation models), Computer programming, Man machine systems, Passenger transportation, Urban planning, Information systems, Systems analysis, Optimization, Evaluation, Regional planning.
Identifiers: *Demand adaptive transportation systems, Man computer planning systems, Computer graphics, Interactive computer graphics.

The study covers a methodology for short-range micro-level planning of demand-adaptive systems for urban public transportation. Existing planning and design tools applied in the context of the traditional transportation study are inadequate because of characteristics inherent to these systems that differentiate them from traditional multipurpose mass transit. The development of a methodology combining advanced computer technology, recent urban information systems technology, and advanced transportation systems analysis, is carried through the construction and implementation of, and experimentation with, a man-computer interactive graphic system for the planning and design of one particular family of demand-adaptive systems, namely bus rapid transit systems in urban corridors. The study does not attempt to discuss legal, political and administrative implications.

PB-212 541 PC$3.25/MF$0.95
City-County Planning Commission, Rockford, Ill.
A MANUAL FOR CAPITAL IMPROVEMENT PROGRAMMING.
Final rept.
Sep 72, 24p RWCCPC-72-21
Prepared in cooperation with Rockford-Winnebago County Planning Commission, Rockford, Ill.

Descriptors: (*Regional planning, *Illinois), Capital, Manuals, Projects, Finance, Proposals, Community development, Liabilities, Assessments, Taxes.
Identifiers: *Winnebago County (Illinois).

The report provides local planning commissions and other municipal officials representing smaller communities in Winnebago County with a concise explanation of capital improvement programming. The Manual provide background information that can be used prior to determining whether a capital improvement program should be undertaken as well as guidelines for the preparation of a capital improvement program. The Manual reviews problems and procedures involved with the collection and analysis of financial information, the indentification of proposed projects, the determination of project priority, and the preparation of the capital improvement program report. (Author)

PB-212 542 PC$5.75/MF$0.95
City-County Planning Commission, Rockford, Ill.
VILLAGE OF CHERRY VALLEY, ILLINOIS. PRELIMINARY COMPREHENSIVE PLAN.
Final rept.
Sep 72, 75p RWCCPC-72-15
Prepared in cooperation with Rockford-Winnebago County Planning Commission, Rockford, Ill. and Village of Cherry Valley, Ill.

Descriptors: (*Urban planning, *Illinois), Land use, Economic development, Policies, Residential buildings, Commercial buildings, Industrial buildings, Public utilities, Urban transportation, Natural resources.
Identifiers: *Cherry Valley (Illinois).

The Comprehensive Plan is a propcsed guide for the future development of the Cherry Valley Planning Area. Included in the text is a summary of existing land uses, population and economic trends and projections, housing characteristics, community facilities, utilities and transportation facilities. Recommendations for land use, public utilities, transportation and circulation and community facilities are based upon goals and development policies. An implementation section is also included. (Author)

PB-212 544 PC$7.00/MF$0.95
East Tennessee Development District, Knoxville.
KNOXVILLE METROPOLITAN AREA LAND USE PLAN.
Preliminary rept.
Jun 72, 98p ET-SA-16
See also PB-212 545.

Descriptors: (*Urban planning, *Tennessee), (*Land use, Urban planning), Objectives, Policies, Land development, Population growth, Residential buildings, Commercial buildings, Industrial buildings, Natural resources, Forest land, Agriculture, Recreation, Land reclamation, Conservation.
Identifiers: *Knoxville (Tennessee).

The report sets forth the goals, objectives and policies for land use development; background data; and a recommended land use plan to serve the forecasted 1991 population. The report emphasizes the retention, conservation and reclamation of natural resources; economically compact urban development; planned urban open spaces; and revitalization of downtown commercial centers for the Knoxville Metropolitan Area. (Author)

PB-212 549 PC$5.25/MF$0.95
City-County Planning Commission, Rockford, Ill.
THE SUBDIVISION AND OFFICIAL MAP REGULATIONS OF THE VILLAGE OF DURAND, WINNEBAGO COUNTY - STATE OF ILLINOIS.
Final rept.
19 Jul 72, 64p RWCCPC-72-12
Prepared in cooperation with Rockford-Winnebago City-County Planning Commission, Rockford, Ill., and Village of Durand Planning Commission, Ill.

Descriptors: (*Urban planning, *Illinois), (*Land use zoning, *Ordinances), Maps, Regulations, Residential buildings, Public utilities, Drainage, Sanitation, Water supply, Public health, Traffic, Penalties, Law enforcement.
Identifiers: *Durand (Illinois).

This is the Subdivision and Official Map Regulations for the Village of Durand, Illinois, which sets forth the procedure for gaining approval of subdivision plats, reservation of lands and promotes sound judgement as to the development of residential areas with concern for proper interrating of traffic patterns, public facilities, surface drainage, utilities, sanitation, water supply and public health. (Author)

PB-212 550 PC$9.00/MF$0.95
Macon County Regional Plan Commission, Decatur, Ill.
THE DEVELOPMENT PLAN FOR NIANTIC TOWNSHIP.
Final rept.,
Jun 72, 136p MCRPC-72-18

Descriptors: (*Urban planning, *Illinois), Land use, Policies, Residential buildings, Industrial buildings, Commercial buildings, Urban transportation, Public utilities, Maps.
Identifiers: *Niantic Township (Illinois).

The report describes a development plan based largely on growth agreements between various governmental agencies within the Township of Niantic, Illinois. It deals specifically with open space, housing, transportation, industrial and commercial and utilities systems. The primary reason for planning on the township level is to increase citizen involvement in the planning process. (Author)

PB-212 551 PC$6.25/MF$0.95
Macon County Regional Plan Commission, Decatur, Ill.
CENTRAL BUSINESS DISTRICT DEVELOPMENT PLAN FOR THE VILLAGE OF BLUE MOUND, ILLINOIS.
Final rept.
Mar 72, 82p MCRPC-72-13

Descriptors: (*Urban planning, *Illinois), (*Central City, Urban planning), Land use, Commercial buildings, Streets, Traffic, Parking facilities, Public utilities.
Identifiers: *Blue Mound (Illinois).

The report is based largely on the analysis of existing conditions. The plan suggests many alternatives which the Village of Blue Mound could utilize to achieve the goals developed by the Village leaders and stated in this report. The primary reason for writing this report is to get local citizens involvement along with the Village's actions to rebuild the downtown area. (Author)

PB-212 557 PC$3.00/MF$0.95
Denver Urban Observatory, Colo.
CITIZEN PARTICIPATION IN DENVER. VOLUME II.
Final rept.,
M. Jay Crowe, and T. Michael Smith. Feb 72, 69p
UO-LCCM-DEN-72-001-2
Contract HUD-H-987
See also PB-206 995.

Descriptors: (*Participative management, Urban areas), (*Colorado, Urban planning), Decision making, Education, Communities.
Identifiers: *Citizen participation, Denver (Colorado).

A detailed case study is reported of citizen participation efforts of volunteer target area resident groups in planned community change. The planning of a higher education center in downtown Denver was the focal point of the eighteen-month study. While a survey of the literature concerning citizen participation and an analysis of the plans for the Auraria Higher Education Center are presented, the main emphasis is on the ebb and flow of resident involvement in the decision-making process. Conclusions from this study provide implications for citizen participation, as a basic concept, in the potential emergence of a participatory decision-making structure. (Author)

PB-212 558 PC$3.00/MF$0.95
Denver Urban Observatory, Colo.

SOCIAL INDICATORS: FIRST YEAR REPORT ON HOUSING AND EMPLOYMENT IN DENVER AND THE DENVER METROPOLITAN REGION.
Final rept.,
Wilbert E. Moore, and M. Jay Crowe. May 72, 49p
UO-LCCM-DEN-72-002
Contract HUD-H-987

Descriptors: (*Urban areas, *Socioeconomic status), (*Residential buildings, Colorado), (*Employment, Colorado), Urban planning, Economic conditions, Statistical data.
Identifiers: Denver (Colorado).

The main thrust of the report is the analysis of the types of data available concerning housing and employment that may contribute to the development of social indicators of the 'quality of urban life'. In addition to statistical materials analyzed on housing and employment, a rather detailed essay on urban social indicators, their construction, and possible uses (and cautionary notes) is presented. (Author)

PB-212 561 PC$3.00/MF$0.95
Nevada Univ., Reno. Center for Water Resources Research.
STUDIES OF TRACE ELEMENTS IN SOILS AND PLANTS FROM THE FOUR CORNERS AREA OF NEW MEXICO.
Project rept. no. 20 (Final), 6 Apr-30 Jun 72,
Nellie B. Stark, and Patricia F. Harris. 1 Sep 72, 96p EPA-R4-72-007
Contract EPA-68-02-0269

Descriptors: (*Air pollution, Trace elements), (*Electric power plants, Air pollution), (*Fly ash, *Trace elements), Environmental surveys, Soil analysis, Plants (Botany), Sampling, Concentration (Composition), Arsenic, Beryllium, Cadmium, Chromium, Fluorides, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium, New Mexico.

A study was initiated as a result of the need to develop background and preliminary data on the environmental effects of coal-fired power plants. The objective of the study was to measure the concentration of eleven trace elements in plants and soils in the Four Corners area of New Mexico. Selection of the elements was made on the basis of data obtained from a survey on the chemical make-up of the fly ash emitted by the power plants in this location. These eleven elements are: As, Be, Cd, Cr, F, Pb, Mn, Hg, Mo, Ni, Se. Some of the elements studied, such as mercury, lead and selenium, are known to be toxic to animals in relatively low concentrations. This study, by sampling plants and soils in two different locations, attempted to develop preliminary data on the potential buildup of each trace element. (Author)

PB-212 564 PC$5.00/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
A DIRECTORY OF MISSOURI'S REGIONAL PLANNING SYSTEM, 1972-73.
Final rept.
Jun 72, 60p MOCOM-PLN-72-0004

Descriptors: (*Regional planning, *Directories), (*Missouri, Regional planning), Organizations, Budgets, Project planning.

The Missouri directory includes twenty different area regional planning commissions with maps and data for 1972 through 1973.

PB-212 565 PC$4.50/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
ROCK HILL ZONING AND SUBDIVISION REGULATION REVIEW AND RECOMMENDATIONS.
Final rept.
Jun 72, 47p MOCOM-PLN-72-0049

Descriptors: (*Urban planning, *Missouri), (*Land use zoning, Ordinances), Regulations, Boundaries, Residential buildings, Commercial buildings, Industrial buildings, Parking facilities, Publicity, Reviews, Recommendations.
Identifiers: *Rock Hill (Missouri).

In order that the City of Rock Hill's planning program becomes a reality, it is necessary to update and revise existing control ordinances to better reflect the needs set forth in the Comprehensive Plan. Revisions, amendments, and deletions are set forth in this document to bring about zoning and subdivision controls that better reflect the current and projected future needs of city planning in Rock Hill, Missouri. (Author)

PB-212 568 PC$3.75/MF$0.95
Neuse River Regional Planning and Development Council, New Bern, N.C.
REGION P MULTI-COUNTY STATISTICAL DATA.
May 72, 33p NRRPDC-72-04

Descriptors: (*Regional planning, *North Carolina), Statistical data, Population growth, Employment, Income, Social welfare, Residential buildings, Education.

In order to be of assistance to the citizens, and local units of governments, organizations, and other agencies within Region P's Planning area, an interim statistical data study was formulated. This study indicates past, present, and probable future population trends within Region P. This initial study will be followed by a more detailed and comprehensive analysis of the planning scope needed on a regional basis, entitled Population and Socio - Economic Base Study. (Author)

PB-212 571 PC$3.00/MF$0.95
Colorado State Univ., Fort Collins. Environmental Resources Center.
THE MECHANISM OF WASTE TREATMENT AT LOW TEMPERATURE. PART A: MICROBIOLOGY,
S. M. Morrison, Gary C. Newton, George D. Boone, and Kirke L. Martin. Aug 72, 112p
Completion-33 W73-00139, OWRR-A-007-COLO (1)
Contracts DI-14-31-0001-3006, DI-14-31-0001-3206
Sponsored in part by Contract DI-14-31-0001-3506.
See also PB-212 572.

Descriptors: (*Sewage treatment, *Cold weather tests), Bacteria, Performance evaluation, Biochemical oxygen demand, Microorganism control (Sewage).
Identifiers: *Psychrophiles.

Low temperatures adversely affect wastewater treatment efficiency by decreasing rates of biological oxidation. Because of the importance of adequate treatment efficiency, the feasibility of inoculating psychrophiles into a wastewater treatment system to increase biological oxidation rates at low temperatures was investigated. Three psychrophiles capable of relatively rapid growth or oxygen uptake in sterilized sewage were selected from water and soil isolates as well as three of 97 Alaskan isolates. With heat sterilized sewage the effects of cell numbers and temperature were the most significant while organism growth type and culture age were also significant. At 5C, the Alaskan psychrophiles removed substantially more BOD within a 72 hr detention period than untreated controls; however, within a 120 hr period, BOD removals never averaged greater than 31.3%.

PB-212 572 PC$3.00/MF$0.95
Colorado State Univ., Fort Collins. Environmental Resources Center.
THE MECHANISM OF WASTE TREATMENT AT LOW TEMPERATURE. PART B: SANITARY ENGINEERING. THE EFFECTS OF WATER TEMPERATURE AND ELEVATION UPON AERATION. BOD AND COD REMOVAL FROM WASTEWATER BY AERATION WITH AIR AND OXYGEN.
Rept. for 1 Jul 70-30 Jun 72,
John S. Hunter, John C. Ward, and Richard P. Johansen. Aug 72, 79p Completion-34 W73-00140, OWRR-A-007-COLO (2)
Contracts DI-14-31-0001-3206, DI-14-31-0001-3506
See also PB-212 571.

Descriptors: (*Sewage treatment, *Cold weather tests), Aeration, Altitude, Dissolved gases, Oxygen, Biochemical oxygen demand, Mathematical models.
Identifiers: Chemical oxygen demand.

A laboratory-scale mechanical aeration system was used to examine the variation in oxygen transfer rates into water as a function of water temperature (0 to 40C). The relative aeration efficiency decreases with increasing elevation, water temperature, and dissolved oxygen concentration. Equations were developed relating saturation dissolved oxygen concentration to temperature and atmospheric pressure to elevation and air temperature. Both air and oxygen were used under identical conditions to determine the effect (if any) of dissolved oxygen concentration on the rate of oxygen demand removal. The use of oxygen in an enclosed contact-stabilization activated sludge wastewater treatment plant suitable for high altitudes and latitudes is shown.

PB-212 573 PC$3.00/MF$0.95
Colorado State Univ., Fort Collins. Dept. of Civil Engineering.
AN INVESTIGATION OF THE EVALUATION OF AUTOMATION AND CONTROL SCHEMES FOR COMBINED SEWER SYSTEMS.
Technical rept. on Task 3,
James J. Anderson, Robert L. Callery, and David J. Anderson. Jan 72, 66p TR-4 W73-00148, OWRR-C-2207 (4)
Contract DI-14-31-0001-3410
Prepared in cooperation with Watermation, Inc., St. Paul, Minn. Report on the Metropolitan Water Intelligence Systems Project.

Descriptors: (*Combined sewers, Automatic control), (*Urban planning, Combined sewers), (*Sewers, Automatic control), Evaluation, Economic analysis, Management, Cost effectiveness, Feasibility, Automation, Sanitary engineering, Systems engineering, Flow control, Water pollution, Storm sewers.
Identifiers: Water pollution control.

The need for a method to evaluate the applicability and potential effectiveness of urban water resource systems and in particular combined sewer control systems is established by: a discussion of its importance as an interface between the public works manager and urban water subsystems using automation and control; the presentation by a flow chart of the decision making process which determines whether all or part of a combined sewer system should be automated, and identification of the vital information needed by the user relative to the adoption and implementation of automation and control schemes for combined sewers. (Author)

PB-212 574 PC$3.00/MF$0.95
Colorado State Univ., Fort Collins. Dept. of Civil Engineering.
SOCIAL AND POLITICAL FEASIBILITY OF AUTOMATED URBAN WATER SYSTEMS.
Technical rept.,
Duane W. Hill, and L. Scott Tucker. Jan 72, 73p TR-5 W73-00149, OWRR-C-2207 (5)
Contract DI-14-31-0001-3410
Report on the Metropolitan Water Intelligence Systems Project.

Descriptors: (*Combined sewers, Automatic control), (*Urban planning, Combined sewers), Decision making, Political objectives, Urban sociolo-

gy, Water quality, Organizations, Legislation, Feasibility, Water pollution, Control systems, Water services.
Identifiers: Water pollution control.

Social and political feasibility and the constraints associated with implementation and operation of control systems is explored. The need for sound analysis of technical and economic feasibility is not negated, but the necessity of the consideration of nontechnical factors is emphasized. Some nontechnical constraints to project implementation and operation are identified including: social choice, feasibility, performance failures and low visibility, communication failures, planning and implementation failures, crisis and crash programming, and low skill and financial supports. These constraints are discussed in terms of their potential effects and possible remedies. (Author)

PB-212 575 PC$3.00/MF$0.95
Colorado State Univ., Fort Collins. Dept. of Civil Engineering.
MODEL OF REAL-TIME AUTOMATION AND CONTROL SYSTEMS FOR COMBINED SEWERS.
Technical rept.,
Warren Bell, Byron Winn, and George L. Smith.
Feb 72, 142p TR-7 W73-00151, OWRR-C-2207 (7)
Contract DI-14-31-0001-3410
Report on the Metropolitan Water Intelligence Systems Project.

Descriptors: (*Combined sewers, Automatic control), (*Sewers, Automatic control), (*Urban planning, Combined sewers), Control systems, Surface water runoff, Hydrology, Rain gages, Rainfall, Computer programs, Real time operations, Storm sewers, Water pollution, Flow control, Overflow.
Identifiers: Water pollution control.

A simple Real-Time Automation and Control System (RTACS) Model, when completed, can be used as a tool to optimize the design of a prototype sewer system whose basic components would include: a physical system, sensing elements, control program, and control elements. A modified version of this model was used both to represent the physical system - including the generation and routing of runoff through the sewer system - and to generate runoff data for the control algorithm which employs optimal control theory. To demonstrate the applicability of the RTACS Model, control logic was developed in detail for a reasonable control objective and assumed physical drainage system served by a single main conduit with one lateral line. The operation of the drainage system was simulated by three reservoirs. Main line flow was simulated by two reservoirs operating in series. Combined flow was simulated by the single reservoir on the lateral acting in parallel with the main line flow at the junction point of the two pipe lines. (Author)

PB-212 576 PC$3.00/MF$0.95
Colorado State Univ., Fort Collins. Dept. of Civil Engineering.
GUIDELINES FOR THE CONSIDERATION OF AUTOMATION AND CONTROL SYSTEMS.
Technical rept.,
L. Scott Tucker, and Duane W. Hill. Feb 72, 85p
TR-8 W73-00152, OWRR-C-2207 (8)
Contract DI-14-31-0001-3410
Report on the Metropolitan Water Intelligence Systems Project.

Descriptors: (*Urban planning, Combined sewers), (*Combined sewers, Automatic control), (*Sewers, Automatic control), Flow control, Computers, Control equipment, Water flow, Surface water runoff, Management planning, Design, Overflows, Water storage, Water pollution, Abatement.
Identifiers: Storm water runoff, Seattle (Washington), Minneapolis (Minnesota), Saint Paul (Minnesota), Detroit (Michigan), San Francisco (California), Water pollution control.

Policy makers and managers are forced to deal with increasingly complex problems related to combined sewer systems. Alternatives for the solution of this complex water problem are needed. The alternative considered here is computer based control of combined sewer flow. The possibilities for control of separated systems are implied. Computer based control is but one of several recognized solutions. Its potential relative to other alternatives for reducing overflows is dependent on each particular situation and must be determined in a systematic evaluation process. The reduction or elimination of overflow is the major problem or objective. Efforts by the municipalities of metropolitan Seattle, Detroit, Minneapolis-Saint Paul and San Francisco are examined in detail. On the basis of these studies, the potential advantages and disadvantages of computer based supervisory or automatic control of combined sewer systems are discussed.

PB-212 577 PC$3.00/MF$0.95
Colorado State Univ., Fort Collins. Dept. of Civil Engineering.
RESEARCH AND DEVELOPMENT NEEDS FOR METROPOLITAN WATER INTELLIGENCE SYSTEMS.
Technical rept.,
Herbert G. Poertner. Feb 72, 20p TR-9 W73-00153, OWRR-C-2207 (9)
Contract DI-14-31-0001-3410
Report on the Metropolitan Water Intelligence Systems Project.

Descriptors: (*Urban planning, Combined sewers), (*Combined sewers, Automatic control), (*Water resources, Urban planning), Water treatment, Automation, Monitors, Computers, Instrumentation, Sensors, Water supply, Water pollution, systems engineering.
Identifiers: Water pollution control.

A survey was made of existing and planned applications of instrumentation in water and wastewater systems of selected urban and metropolitan areas of the United States. The basic goal was to make available information concerning instrumentation and automation that would be useful to decision-makers in providing and operating such systems. The problems of planning, designing, implementing, maintaining, operating and financing instrumented water and wastewater systems are reported. (Author)

PB-212 578 PC$3.00/MF$0.95
American Society of Civil Engineers, New York.
METROPOLITAN INDUSTRIAL WATER USE.
Technical memo.,
L. Scott Tucker, Jamie Millan, and Wilford W. Burt. May 72, 62p TM-16 W73-00260, OWRR-C-3142 (3693) (2)
Contract DI-14-31-0001-3693

Descriptors: (*Urban areas, Water consumption), (*Water consumption, *Industrial water), Inventories, Tables (Data), Water pollution, Sources, Water resources.
Identifiers: Standard Metropolitan Statistical Areas, Water use.

Using State water withdrawals and parameters defining industrial activity, estimates were made of the total self-supplied industrial withdrawal in each Standard Metropolitan Statistical Area (SMSA) across the nation. A SMSA is an area delineated to include at least one city of 50,000 or more inhabitants. Self-supplied SMSA industrial withdrawals (other than for thermoelectric power) in 1964 were at least 63% of the combined public plus self-supplied non-thermoelectric power industrial withdrawals in SMSA's. Public-controlled water supplies appear to account for a relatively small portion of the water withdrawn in metropolitan USA. The findings lead to the suggestion that at least half of the national water pollution problem originates in SMSA's, and to the conclusion that schemes for improving the management of water resources in metropolitan areas that do not take into account the significant role of private interests must be regarded as only partial potential remedies. There is a clear need for quantification of industrial water withdrawals and industrial wastewater volumes and effluent qualities in metropolitan areas.

PB-212 579 PC$3.00/MF$0.95
American Society of Civil Engineers, New York.
HYDROLOGIC EFFECTS OF URBANIZATION IN THE UNITED STATES.
Technical memo.,
M. B. McPherson. Jun 72, 54p* TM-17 W73-00261, OWRR-G-3142 (3693) (3)
Contract DI-14-31-0001-3693

Descriptors: (*Urbanization, *Hydrology), Reviews, Urban areas, Precipitation (Meteorology), Microclimatology, Water resources, Water supply, Floods, Water pollution, Mine waters, Surface water runoff, Water conservation.

The contents include the following topics on urbanization's effects upon hydrology: Urbanization indicators; Character of precipitation; Micro-scale climatic effects; Major effects resulting from urban water resources facilities; Projected impact of community-scale urban water conservation measures; Water supply impact; Flooding effects; Pollution effects; Effects of mining activities; Effects of other water-body uses; Water balance inventories; Outline for selected case studies.

PB-212 580 PC$3.00/MF$0.95
American Society of Civil Engineers, New York.
URBAN RUNOFF.
Technical memo.,
M. B. McPherson. Aug 72, 53p* TM-18 W73-00262, OWRR-C-3142 (3693) (4)
Contract DI-14-31-0001-3693

Descriptors: (*Urbanization, *Surface water runoff), (*Hydrology, *Urban areas), (*Water pollution, Surface water runoff), Reviews, Sewers, Storm sewers, Flood control, Management planning, Research planning.
Identifiers: *Storm water runoff.

The report is a review of the effects of urbanization on hydrology. Topics discussed include the following: Urban stormwater disposal; Land-use changes; Morphological changes in drainage; Changes in flood characteristics; Flood mitigation versus the amenities of drainage; Some management possibilities; Research status and needs.

PB-212 581 PC$3.00/MF$0.95
Minnesota Univ., Minneapolis. Water Resources Research Center.
ANNUAL REPORT (8TH), WATER RESOURCES RESEARCH CENTER.
Aug 72, 115p WRRC-Bull-54 W73-00263, OWRR-A-999-MINN (26)

Descriptors: (*Water resources, *Minnesota), Research, Reviews, Management, Attitudes, Water pollution, Subsurface irrigation, Government policies, Financial management, Forestry, Flood forecasting, Projects, Employment.

The fiscal year 1972 budget of the Center was $449,704. The Center supported 20 research projects involving 21 faculty members. These research projects were concerned with: water resources administration, zooplankton biomass in Lake Superior, mathematical watershed system analysis, aquatic plants, eutrophic lakes, groundwater basin information, mist irrigation, watershed runoff, soil water movement, nearshore periphyton, environmental movement, Mississippi River ecology, perception of water resources problems, financing of water resources development, water pollution social factors, water resources attitudes, forest management, water resources policies, subsurface irrigation, and flood forecasting. About 67 students received employ-

ment through the Center's program. During fiscal year 1972, there were 25 reports generated through research projects. (Author)

PB-212 583 PC$3.00/MF$0.95
Rutgers - The State Univ., New Brunswick, N.J. Water Resources Research Inst.
INVENTORY OF ESTUARINE SITE DEVELOPMENT LAGOON SYSTEMS: NEW JERSEY SHORE,
George H. Nieswand, Calvin W. Stillman, and Anthony J. Esser. Sep 72, 42p W73-00265, OWRR-B-040-NJ (1)
Contract DI-14-31-0001-3912

Descriptors: (*Lagoons (Landforms), Inventories), (*Water resources, Economic development), (*Estuaries, *New Jersey), Sites, Residential buildings, Recreation, Shores, Aerial photographs, Dredging, Sanitary sewers, Maps.

An inventory of estuarine site development lagoon systems along the New Jersey shore was developed for that portion of the shoreline extending from Sandy Hook to Cape May Point. Lagoon systems were identified by a visual inspection of air photo index sheets. Using enlarged contact prints, the following information was subsequently developed for each lagoon system: location, area, lagoon developed shoreline, inland penetration, total length of lagoons, remote point along lagoons, total length of roads, and number of houses. Supplementary information, including lagoon development names, dredging permit dates, data regarding the status of sanitary sewers, and the total number of lots in each lagoon system, was also obtained. The data indicate that a substantial amount of lagoon development exists along the New Jersey shore from Sandy Hook to Cape May Point. A total of 14.2 square miles of lagoon systems were identified along this shoreline, 53.8 miles of lagoon developed shoreline, 166.1 miles of lagoons, 188.0 miles of lagoon system roads, 29,824 lagoon lots, and 14,591 houses. (Author)

PB-212 586 PC$3.00/MF$0.95
California Univ., Los Angeles. School of Public Health.
MEASUREMENT AND MANAGEMENT ASPECTS OF WATER TOXICOLOGY: THE MALIBU WATERSHED, A MIXED RESIDENTIAL AND WILDERNESS AREA,
Earl S. Flowers. Jul 72, 90p W73-00268, OWRR-A-038-CAL (1)
Contract DI-14-31-0001-3505

Descriptors: (*California, Water quality), (*Water quality, *Watersheds), Water resources, Water pollution, Irrigation, Land use, Water analysis, Chlorides, Inorganic nitrates, Vegetation, Terrain, Heat, Trace elements, Toxicology, Cadmium.
Identifiers: Dissolved solids, Ventura County (California), Los Angeles County (California), Water pollution effects (Animals), Water pollution effects (Plants), Watershed management.

A preliminary survey of the Malibu Creek Watershed, California, was conducted to determine dry season water quality and to inventory present and future demands on the water resource in a water deficit region with predominantly chaparral vegetation and mixed residential and wilderness areas. Terrain, vegetation, geology, land use, and water quality were evaluated and described, and preliminary toxicology studies were carried out. Studies on wet season water quality are in progress. (Author)

PB-212 590 PC$6.75/MF$0.95
Stone (Ralph) and Co., Inc., Los Angeles, Calif.
THE USE OF BAGS FOR SOLID WASTE STORAGE AND COLLECTION.
Final rept.
1972, 297P* EPA-SW-42d-72
Grant G06-EC-00172
Prepared in cooperation with City of Inglewood, Calif.

Descriptors: (*Refuse disposal, *Bags), (*Garbage disposal, Bags), Collection methods, Bag papers, Polyethylene, Time studies, Comparison, Efficiency, Benefit cost analysis, Questionnaires, Public opinion, Earthfills, Field tests, Performance evaluation.
Identifiers: *Solid waste disposal, Paper bags, Plastic bags, Sanitary landfills.

The study was conducted to evaluate the suitability of disposable plastic and paper sack materials for use as solid waste containers. Six residential areas in Inglewood, California, were selected; three were to receive bags for test use and the remainder to serve as a control. Bag systems studied included household polyethylene and paper bags on holders, free-standing paper bags and polyethylene can liners as well as large polyethylene commercial bin liners that were distributed to a number of restaurants. Results were obtained by using time and motion studies and this information was reinforced by laboratory testing and by an aggressive questionnaire program. A model of the collection system was then developed and subsequent simulation studies were employed fo r cost analysis. The project demonstrated that bags are quite satisfactory as solid waste container replacements for cans. The most prominent problems, however, were the difficulties in developing efficient bulk storage and distribution methods of the bags.

PB-212 595 PC$5.75/MF$0.95
Indiana Dept. of Commerce, Indianapolis. Div. of Planning.
INDIANA - INTERGOVERNMENTAL CO-OPERATION. PROCEDURES GUIDE PROJECT NOTIFICATION AND REVIEW SYSTEM.
Final rept.
1972, 75P HUD-IND-P-112-4

Descriptors: (*Project planning, Instructions), (*Regional planning, *Indiana), Reviews, Law (Jurisprudence), Local government, State government, Federal government, Evaluation, Federal budgets, Regulations, Policies.
Identifiers: Federal assistance programs.

The report is concerned with describing the channels and procedures all nonfederal participants in federal grant-in-aid programs under the Intergovernmental Cooperation Act of 1968 and OMB Circular A-95 should follow in submitting a grant for an area under the jurisdiction of the State of Indiana. Its purpose is to assure that all proposed programs can be coordinated with the rest of the programs in the State and to prevent duplication of effort. (Author)

PB-212 596 PC$3.75/MF$0.95
Indiana Dept. of Commerce, Indianapolis. Div. of Planning.
INDIANA LOCAL HOUSING AUTHORITIES.
Final rept.
1972, 35P HUD-IND-P-112-7

Descriptors: (*Regional planning, *Indiana), (*Residential buildings, *Project planning), Reviews, Legislation, Instructions, Organizing, Policies.
Identifiers: Housing authorities.

The purpose of this publication is to provide basic information concerning the organization of housing authorities in Indiana and to delineate responsibilities in forming and operating a housing authority. Sections of this publication include the following: the functions and organization of local housing authorities; a summary of federal housing programs; the status of state housing legislation; an appendix containing a question and answer section to clarify information about basic housing authority principles, procedures and responsibilities; and a bibliography. (Author)

PB-212 597 PC$3.75/MF$0.95
Department of Housing and Urban Development, Washington, D.C.
STATE OF INDIANA TRANSPORTATION NEEDS STUDY, 1972.
Summary rept.
1971, 35P

Descriptors: (*Regional planning, *Transportation), (*Transportation management, *Indiana), Highways, Airports, Federal budgets, Urban transportation, Mass transportation, Finance, Terminal facilities, Cost analysis, Railroads, Capital, State government, Local government, Investments.

The report was concerned with trying to completely catalog transportation needs and capital improvement plans for all modes of transportation in Indiana. The work is a part of a larger national transportation plan process involving many elements of both the state and federal government. The report covers the level of federal expenditures and source of funds needed to finance a transportation program for Indiana until 1990. It presents studies on highway needs, urban highway related needs, urban transit needs and airport needs. It is concluded with figures showing capital improvement for highway, airports, intercity terminals and urban transit systems. (Author)

PB-212 598 PC$4.25/MF$0.95
Indiana Dept. of Commerce, Indianapolis. Div. of Planning.
INDIANA SOLID WASTE MANAGEMENT.
1971, 43p CPA-IN-05-00-0131-2

Descriptors: (*Waste disposal, Reviews), (*Indiana, Waste disposal), Refuse disposal, Garbage disposal, Urban areas, Rural areas, Law (Jurisprudence), Public opinion, Economic analysis, Water pollution, Leaching, Surface drainage, Collecting methods, Cost estimates, Agricultural wastes, Lagoons (Ponds), Inorganic nitrates, Management planning, Livestock.
Identifiers: *Solid waste disposal, Manure.

The report is a general background paper on the social, economic and physical problems caused by solid waste. It covers solid waste management in terms of the problem of collecting, processing, treating and disposing of solid waste and the need for cooperation between the rural and urban sectors in these areas and also in the areas of administering and financing the operation. The appendix is a summary of Indiana's laws which regulate refuse and its disposal.

PB-212 599 PC$3.00/MF$0.95
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME XVII. A COMPILATION OF TECHNICAL REPORTS (4TH) ON THE BIOLOGICAL EFFECTS AND THE PUBLIC HEALTH ASPECTS OF ATMOSPHERIC POLLUTANTS,
M. Y. Nuttonson. 1972, 153p AICE-AIR-72-17 APTD-1309
Grant EPA-R-800878
See also Volume 16, PB-211 466.

Descriptors: (*Air pollution, *Public health), (*USSR, Air pollution), (*Sulfur dioxide, Air pollution), (*Nitrogen dioxide, Air pollution), (*Alcohols, Air pollution), (*Vanadium oxides, Air pollution), (*Chloroprene, Air pollution), (*Ethylene oxide, Air pollution), (*Styrenes, Air pollution), (*Butadienes, Air pollution), Industrial wastes, Standards, Furfurals, Methyl alcohol, Ethanols, Toxicology, Periodicals, Translations, Permissible dosage.
Identifiers: *Oxetanone/4-methylene-2, *Hexane diamines, *Air pollution effects (Animals).

Contents:
Maximum permissible concentrations of noxious substances in the air;

Data for the sanitary validation of maximum permissible concentrations of sulfur dioxide in combination with phenol;
Data for the mean daily maximum permissible concentration of nitrogen dioxide in atmospheric air;
Data for a sanitary standardization of low concentrations of a mixture furfural, methanol, and hydrolytic ethanol in the air;
Threshold concentrations of diketene during short-term inhalation;
Validation of the mean daily maximum permissible concentration of vanadium pentoxide in atmospheric air;
The threshold of the reflex effect of chloroprene by the method of electroencephalography;
Toxicity of microconcentrations of ethylene oxide;
Standardization of alpha-methylstyrene in the air;
Maximum permissible concentration of divinyl in atmospheric air;
New data for the maximum permissible concentration of hexamethylenediamine in populated areas.

PB-212 601 PC$5.75/MF$0.95
Macon County Regional Plan Commission, Decatur, Ill.
STRUCTURAL AND NEIGHBORHOOD ANALYSIS. DECATUR URBANIZED AREA.
Final rept.
Jul 71, 73p MCRPC-71-2975

Descriptors: (*Residential buildings, Surveys), (*Urban planning, *Illinois), Deterioration, Environmental surveys, Neighborhoods, Maps, Urban areas.
Identifiers: *Substandard dwellings, *Decatur (Illinois), *Mount Zion (Illinois), *Harristown (Illinois), Dilapidated houses.

The report presents findings of an investigation of the structural condition of housing units within the major residential center of Macon County, Illinois--the city of Decatur and the villages of Mt. Zion and Harristown.

PB-212 606 PC$3.00/MF$0.95
Walden Research Corp., Cambridge, Mass.
AIR POLLUTANT EMISSION INVENTORY FOR THE STATE OF NEW HAMPSHIRE.
Summary rept.,
Paul Morgenstern, Josette C. Goldish, and Ronald G. Orner. Jan 72, 48p APTD-1342
Contract EPA-68-02-0049
Prepared in cooperation with New Hampshire Air Pollution Control Agency, Concord.

Descriptors: (*Air pollution, *New Hampshire), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Natural gas, Solvents, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Coal, Fuel oil, Evaporation, Waste disposal, Demography, Electric power plants, Waste disposal, Incinerators.
Identifiers: *Air quality data, Implementation Air Pollution Planning Program, Solid waste disposal, Air Quality Control Regions, Open burning, Automobile exhaust.

A summary is presented of the results from an inventory of air pollutant emissions within the State of New Hampshire. The contaminants considered included sulfur oxides, carbon monoxide, nitrogen oxides, hydrocarbons, and particulates. Estimates of the annual emission of the pollutants were developed for the year 1970 and are summarized. The emissions within each of these Regions are summarized by source type. The methodology for preparing the inventory consisted of first determining the consumption of fuels according to combustion sources for power, space heating, and other industrial process needs. The emission of pollutants arising from this set of sources is estimated by the application of appropriate emission factors in conjunction with selected fuel composition. For the case of particulate emissions, the factors also take cognizance of the reduction affected by existing installed control devices. (Author)

PB-212 609 PC$3.00/MF$0.95
Battelle Columbus Labs., Ohio.
HAZE FORMATION -- ITS NATURE AND ORIGIN.
Final rept.,
William E. Wilson, Jr., Warren E. Schwartz, and G. W. Kinzer. 28 Jan 72, 77p CRC-APRAC-CAPA-6-68-3
Grant PHS-AP-00828

Descriptors: (*Haze, *Gas analysis), (*Air pollution, Haze), (*Nitrogen dioxide, *Photochemical reactions), Exhaust gases, Aerosols, Sources, Samplers, Cyclone separators, Light scattering, Infrared spectra, Particles, Gas chromatography, Mass spectroscopy, Smog, Rural areas, Urban areas, Nitrogen oxides, Cyclohexene, Terpene hydrocarbons.
Identifiers: Automobile exhaust, Sinks (Biosphere), Pinenes.

Aerosols were analyzed which were obtained in New York City, Great Smoky Mountains, in laboratory smog chamber facilities, and from primary automobile exhaust. The results indicated that certain organic chemicals were present in aerosols associated with auto exhaust which were not present in aerosols from rural atmospheres. On the other hand, at least one organic compound was present in aerosols from rural atmospheres which was not present in urban air aerosol samples. These results indicate that the presence of certain organic compounds in aerosol samples may indicate the origin of haze. The products from the photochemical reaction of NO2 and the aerosol samples were also analyzed.

PB-212 610 PC$5.75/MF$0.95
Denver Regional Council of Governments, Colo.
HOUSING IN THE DENVER REGION.
Summary rept.
31 May 72, 72p DRCOG-72-023

Descriptors: (*Urban planning, *Colorado), (*Residential buildings, Urban planning), Inventories, Building codes, Leasing, Value, Income, Population growth, Standards, Demand (Economics).
Identifiers: *Denver (Colorado).

The report contains an inventory of the housing supply of the Denver SMSA and constituent counties as of April 1, 1972, by tenure, price-rent ranges and by minority occupancy. Vacancy ratios and household sizes are estimated. The housing requirements of the region to 1975 are projected by county. These overall requirements are presented by major components: population increase, vacancies, and domolitions of substandard units. (Author)

PB-212 616 PC$4.50/MF$0.95
Consortium of Universities, Washington, D.C. Urban Transportation Center.
DOWNTOWN BUS TRANSPORTATION.
Final rept.,
Lawrence D. Goldstein. Jun 72, 51p* UTC-4
UMTA-DC-11-0003-72-6
Contract DOT-UT-394

Descriptors: (*Urban transportation, *Buses (Vehicles)), Central city, Surveys, Vehicular traffic, Operating costs.

The research examined special downtown or small bus systems in forty cities throughout the United States. Data were collected in questionnaires received from fourteen cities using small-size buses and nine cities using standard vehicles. Emphasis is focused on vehicle design, type of service (ie. route coverage, headways, vehicles in service, fares, patronage, and duration of service), system costs, public response, and impact on center city traffic circulation. The analysis is broken down between the two basic types of service. The report develops recommendations for efficient use of small and conventional vehicles, integrated downtown bus transportation service, and user-oriented planning functions. Complete survey data are appended. (Author)

PB-212 618 PC$8.50/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
ANNEXATION STUDY FOR HAZELWOOD, MISSOURI.
Final rept.
Jun 72, 127p MOCOM-PLN-72-0014

Descriptors: (*Urban planning, *Missouri), Boundaries, Population growth, Land use, Residential buildings, Expenses, Revenue, Policies, Recommendations.
Identifiers: *Hazelwood (Missouri), *Annexation.

Based on a Comprehensive Plan completed for the City of Hazelwood in Fiscal Year 1971-72, the growth potential for the city was found to be limited based on the present unincorporated area. In order to establish the economic, political and physical land feasibility of annexation, a study dealing with adjacent unincorporated lands was developed. Within the maximized annexed feasibility area, basic studies dealing with population, land use, housing, municipal revenues and expenditures and special jurisdictional problems were completed. The formation of an annexation policy is included in this study. (Author)

PB-212 620 PC$3.00/MF$0.95
Transport and Road Research Lab., Crowthorne (England).
THE DEVELOPMENT OF A CORROSION INHIBITOR FOR ADDITION TO ROAD DE-ICING SALT,
R. R. Bishop. 1972, 30p TRRL-LR-489

Descriptors: (*Corrosion inhibitors, Deicers), (*Deicers, Roads), Additives, Inorganic salts, Great Britain.

A corrosion inhibitor for use as an additive to highway de-icing salt has been developed. Laboratory experiments have been used as screening tests and the more promising materials have been evaluated in trials on cars. The corrosive action of salt on mild steel is almost constant over a concentration range of 10 to 0.05 per cent of salt in solution. The protection given by inhibitors diminishes markedly as they become diluted and they are only effective in reducing corrosion if their initial addition is of the order of 7 per cent of salt. This has been demonstrated both in laboratory tests and in field trials. (Author)

PB-212 623 PC$3.00/MF$0.95
Ohio State Univ., Columbus. Dept. of Landscape Architecture.
SHORT COURSE ON ROADSIDE DEVELOPMENT (30TH) HELD AT COLUMBUS, OHIO, OCTOBER 4-8, 1971.
May 72, 193p*
See also Short Course No. 29, PB-200 624. Prepared in cooperation with Ohio Dept. of Highways, Columbus.

Descriptors: (*Highways, *Landscaping), (*Environmental engineering, *Specialized training), Programmed instruction, Planning, Participative management, Meetings, Vegetation, Maintenance management, Forestry, Soil properties, Water resources, Fertilizers, Erosion control, Pollution.
Identifiers: *Roadside development, Roadway corridors, Highway beautification.

'Bio-Engineering' is the theme for the 30th Short Course on Roadside Development. The subject

matter presented by many speakers relates to our environment and the evaluating processes in roadway corridor locations, roadway designing, with considerations of minimizing damage to natural resources and harmful effects to people. Mehods and techniques in maintaining the roadway environment as planned and constructed are discussed.

PB-212 627 PC$3.00/MF$0.95
Schiller Park Village Plan Commission, Ill.
PROBLEM SOLVING. PHASE II. SCHILLER PARK, ILLINOIS.
Final rept.
Feb 72, 88p
Prepared in cooperation with Candeub, Fleissig and Associates, Madison, Wis., Rept. no. CAN-FLE-72-0001. See also Phase 1, PB-198 071.

Descriptors: (*Urban planning, *Illinois), (*Commercial land use, Urban planning), Benefit cost analysis, Boundaries, Standards, Land use zoning, Revisions, Ordinances, Population growth, Commerce, Trends, Recommendations.
Identifiers: *Schiller Park (Illinois).

The report contains a Commercial Area Market Feasibility Study and a Commercial Area Plan Effectuation Study. The retail market in the area is identified and projected. Several methods of implementing the plan are explored. The report also contains recommendations for revising the Village's Zoning Ordinance. (Author)

PB-212 631 PC$9.75/MF$0.95
Escambia-Santa Rosa Regional Planning Council, Pensacola, Fla.
PENSACOLA METROPOLITAN HOUSING STUDY.
Final rept.
Jun 72, 153p ESRRPC-72-01

Descriptors: (*Regional planning, *Florida), (*Residential buildings, Regional planning), Population growth, Blighted areas, Income, Demand (Economics), Objectives, Recommendations, Reviews.
Identifiers: *Escambia County (Florida), *Santa Rosa County (Florida), *Minority group housing.

The report represents the third comprehensive analysis of housing needs in the Pensacola SMSA. An analysis of housing development was conducted to determine how many new housing units have been added to the existing supply within the last few years; what type of housing units have been added, and in what price range. Projections of population growth and household formation have been projected for the period between 1972 and 1980. A study of minority groups and minority housing needs was conducted. The progress of 'Operation Breakthrough' on all three levels, Federal, State, and local was reviewed. (Author)

PB-212 635 PC$3.00/MF$0.95
International Joint Commission-United States and Canada.
JOINT AIR POLLUTION STUDY OF ST. CLAIR - DETROIT RIVER AREAS FOR INTERNATIONAL JOINT COMMISSION CANADA AND THE UNITED STATES.
Jan 71, 267p APTD-1305

Descriptors: (*Air pollution, *Michigan), (*Canada, Air pollution), Inventories, Sources, Tables (Data), Sulfur dioxide, Particles, Odors, Demography, Meteorological data, Oxidizers, Trace elements, Metals, Pyrenes, Fluorides, Hydrogen sulfide, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Atmospheric corrosion, Combustion products, Exhaust gases, Industrial wastes, Waste disposal, Atmospheric diffusion, Cost estimates, Transportation, International relations.
Identifiers: *Air quality data, Air pollution effects (Plants), Benzopyrenes, Air pollution effects (Materials), Detroit (Michigan), Port Huron (Michigan), Saint Clair County (Michigan), Macomb County (Michigan), Oakland County (Michigan), Wayne County (Michigan).

As a result of a request, by the City of Windsor, that action be taken to abate the flow of transboundary-pollution emanating from the industrial complex in Wayne County, Michigan, the Governments of Canada and the U.S. initiated an investigation. During this investigation of the air pollution, the following work was undertaken: Air quality measurements were made; Odorous pollutants were investigated; Meteorological measurements were taken; An inventory of atmospheric emissions was made of pollutants emanating from all sources; and A study of the effects of air pollutants in the area on selected vegetation and materials was conducted. The report describes the methods of evaluation and presents the results and conclusions.

PB-212 636 PC$5.25/MF$0.95
Milwaukee Urban Observatory, Wis.
RECODIFICATION OF MILWAUKEE MUNICIPAL ORDINANCES: PHASE I. ANALYSIS OF NEED.
Final summary rept.,
Ramon A. Klitzke. Sep 72, 65p UO-LCCM-MIL-72-003
Contract HUD-H-987

Descriptors: (*Urban planning, *Wisconsin), (*Ordinances, Revisions), Local government, Traffic engineering, Harbors, Streets, Public buildings, Regulations, Land use zoning, Commercial buildings, Safety, Vehicles, Public utilities, Sanitation, Building codes, Residential buildings, Licenses, Standards.
Identifiers: *Milwaukee (Wisconsin).

The Milwaukee Code of Ordinances, consisting of 109 chapters and three appendices, had been frequently amended on a piecemeal basis. By early 1971, it had become apparent to many public officials that it was time for the entire Code to be studied in preparation for redrafting into a modern, organized instrument capable of adequately serving the needs of the city. The report summarizes the results of a study of Volume I of the Code, 'General Ordinances of the City of Milwaukee.' It indicates duplications, conflicts, and inconsistencies within the Code, itself, and in relation to Wisconsin Statutes. (Author)

PB-212 639 PC$5.75/MF$0.95
City-County Planning Commission, Rockford, Ill.
VILLAGE OF DURAND ZONING ORDINANCE.
Final rept.
Jul 72, 73p RWCCPC-72-11
Prepared in cooperation with Village of Durand Planning Commission, Ill.

Descriptors: (*Urban planning, *Illinois), (*Land use zoning, Ordinances), Regulations, Boundaries, Dimensions, Parking facilities, Law enforcement, Licenses, Residential buildings, Commercial buildings, Industrial buildings, Houses, Trailers.
Identifiers: *Durand (Illinois).

The Zoning Ordinance of the Village of Durand, State of Illinois, establishes regulations controlling the uses of land, the bulk, locations and uses of structures, the areas and dimensions of sites, and the appearance of certain uses, and structures; requiring the provision of usable open space, and off-street parking and loading; providing for the amendment of the district boundaries and the regulations; and providing for the administration and enforcement of the regulations and prescribing penalities for the violation of such ordinance. (Author)

PB-212 640 PC$4.00/MF$0.95
Rappahannock Area Development Commission, Fredericksburg, Va.
HOUSING ELEMENT FOR RAPPAHANNOCK AREA DEVELOPMENT COMMISSION (RADCO) PLANNING DISTRICT 16 - CAROLINE, KING GEORGE, SPOTSYLVANIA AND STAFFORD COUNTIES AND CITY OF FREDERICKSBURG,
Ronald J. Rebman. Jun 72, 38p

Descriptors: (*Regional planning, *Virginia), (*Residential buildings, Regional planning), Objectives, Supply (Economics), Rural areas, Urban areas, Building codes, Ordinances, Availability, Statistical data.
Identifiers: *Caroline County (Virginia), *Fredericksburg (Virginia), *King George County (Virginia), *Spotsylvania County (Virginia), *Stafford County (Virginia), Rappahannock Area Development Commission.

The Housing Element identifies the particular housing problems of the Planning District, the obstacles to the solution of these problems, the housing planning activities currently in process, and a character sketch of the local housing supply. (Author)

PB-212 642 PC$3.00/MF$0.95
West Monroe Planning Commission, La.
WEST MONROE METROPOLITAN PLAN.
Interim rept. 1 Sep 71-1 Sep 72,
John C. Gaillard, and Mike A. Rasco. Aug 72, 14p
WMMP-OCOG-72-1
Prepared in cooperation with Ouachita Council of Governments, Monroe, La.

Descriptors: (*Urban planning, *Louisiana), History, Economic development, Topography, Drainage, Land use, Streets, Roads, Residential buildings, Commercial buildings, Industrial buildings.
Identifiers: *West Monroe (Louisiana).

The report begins with a historical sketch of West Monroe and follows with the basic data for the development of a comprehensive plan of the West Monroe area. This basic data includes a summary of studies on topography, soil conditions, existing land-use, existing circulation and housing. From these basic data studies an interim land use and circulation plan has been developed. The carrying out of the plan will be coupled with more detailed study and design to insure that it realizes the highest aspirations of the community for a compatible environment. (Author)

PB-212 647 PC$3.00/MF$0.95
McLean County Regional Planning Commission, Bloomington, Ill.
MCLEAN COUNTY REGIONAL PLANNING COMMISSION. ANNUAL REPORT 4.
Rept. for 1970-1971.
Dec 71, 19p AR-MCRCP-71

Descriptors: (*Regional planning, *Illinois), Projects, Operations, Reviews, Classifications, Personnel, Statistical data.
Identifiers: *McLean County (Illinois).

The fourth annual report is made by the Regional Planning Commission to the residents and supporting agencies within McLean County, Illinois. The report includes a resume' of the Commission's activities for the fiscal year 1970-1971 including work completed, financial statements, listing of members and a proposed work program.

PB-212 648 PC$6.50/MF$0.95
Saginaw County Metropolitan Planning Commission, Mich.
PLAN IMPLEMENTATION. JOB 605.
Jul 72, 86p
Report on Saginaw County Comprehensive Planning Program.

Descriptors: (*Regional planning, *Michigan), Proposals, Land use, Recreational facilities, Agriculture, Residential buildings, Commercial

buildings, Industrial buildings, Public utilities, Highways, Objectives, Urban transportation, Evaluation.
Identifiers: *Saginaw County (Michigan).

The report discusses the various alternatives, programs, and procedures that can be utilized in working toward implementation of the county Development Plan. Methods considered include implementing the overall plan as well as examining the implementation of specific functional elements. The report concludes with a general evaluation of the outlook for implementation. (Author)

PB-212 654 PC$3.00/MF$0.95
Bureau of Mines, Washington, D.C.
EMISSION CHARACTERISTICS OF PROPANE AS AUTOMOTIVE FUEL.
Rept. of investigations,
Jerry R. Allsup, and R. D. Fleming. Sep 72, 39p
BuMines-RI-7672
Prepared in cooperation with Bureau of Mines, Bartlesville, Okla. Bartlesville Energy Research Center.

Descriptors: (*Air pollution, Exhaust gases), (*Automobile engines, *Exhaust gases), (*Automotive fuels, *Propane), Internal combustion engines, Dynamometers, Carbon monoxide, Hydrocarbons, Liquefied petroleum gases, Nitrogen oxides, Concentration (Composition).
Identifiers: *Automobile exhaust, Air fuel ratio, Ignition timing.

Air pollutants in exhaust gas produced from LP-gas (propane) were studied using both laboratory engines and vehicles. The objective of the study was both to evaluate propane as a low-pollution fuel and to provide information on adjustment of engine parameters for advantageous use of propane as a low-pollution fuel. Variables in the study were air-fuel ratio (A/F), ignition timing schedule, and ambient temperature. Data comparable to that for propane relating A/F and ambient temperature to emissions are shown for natural gas and for gasoline. Results showed that engines using propane have favorable lean limit characteristics as compared with gasoline; that is, the engine can operate over a wider range of A/F with minimum carbon monoxide and hydrocarbon emissions. Propane and natural gas emission levels were similar. (Author)

PB-212 661 PC$3.00/MF$0.95
Western Forest Products Lab., Vancouver (British Columbia).
CHEMICAL ANALYSES OF VENEER-DRYER CONDENSATES.
Information rept.,
H. S. Fraser, and E. P. Swan. Jul 72, 21p VP-X-101

Descriptors: (*Plywood, *Drying), (*Gas chromatography, Air pollution), (*Wood products, Air pollution), (*Air pollution, *Hydrocarbons), Veneers, Gas analysis, Fatty acids, Terpene hydrocarbons, Lipids, Toxicology, Smoke, Particles, Industrial wastes, Canada.

The compounds present in the smoke from a veneer dryer operating on Douglas-fir were condensed with great difficulty. The condensate was fractionated and characterized. Organic compounds are about one-third resin and fatty acids and about two-thirds neutrals. The acids identified were pimaric, sandaracopimaric, isopimaric, abietic, dehydroabietic, dihydroabietic, palmitic, stearic, oleic and linoleic. The neutral fraction was a complex mixture which was incompletely characterized. The total organic condensate was slightly toxic. Discussion of the present situation on smoke emissions from veneer dryers in British Columbia together with suggestions for further research are presented. (Author)

PB-212 668 PC$5.75/MF$0.95
Neuse River Regional Planning and Development Council, New Bern, N.C.
INITIAL REGIONAL PLANNING GUIDE FOR THE NEUSE RIVER REGION OF NORTH CAROLINA.
Interim rept. fy 71-72.
Jun 72, 71p NRRPDC-72-01

Descriptors: (*Regional planning, *North Carolina), Population growth, Economic development, Residential buildings, Commercial buildings, Industrial buildings.
Identifiers: Neuse River Region.

The report comprises an outline of regional goals and a sketch development plan to be used as a guide and an interim plan prior to the development of a Comprehensive Regional Development Plan for the Neuse River Region of North Carolina. Planning for nine counties is accomplished against a background of the historic, physiographic, and demographic plans by local units of government, and the economic factors which have shaped the entire nine-county area generally surrounding the growth centers and constituting its primary sphere of economic influence. The report contains an inventory of existing data - past, present and projected statistics on population and economy - and an analysis of current land use. An attempt is made to realistically evaluate the assets and liabilities of the region to determine how its potential development may be effectively guided through an orderly planning process. (Author)

PB-212 674 PC$7.50/MF$0.95
Piedmont Triad Council of Governments, Greensboro, N.C.
REGIONAL OPEN SPACE AND RECREATION STUDY. PHASE I.
Interim rept. 30 Apr 71-1 May 72.
May 72, 108p CPA-NC-04-00-0143
Prepared in cooperation with Guilford County Planning Dept., Greensboro, N.C.

Descriptors: (*Regional planning, *North Carolina), Recreational facilities, Parks, Land use, Population growth, Surveys.

The Phase I study describes existing public, private, and commercial open space/recreation facilities within the 11-count Piedmont Triad Region; develops standards for measuring open space/recreation need and determines that need; discusses issues to be confronted by local governments and the Piedmont Triad Council of Governments in accepting and funding a Regional Open Space/Recreation Plan, and recommends a scope of services to be performed under Phase II of the Regional Open Space and Recreation Study. The Report represents the inventory and analysis state of a two-phase study to provide a Regional Open/Space Recreation Plan and Program. (Author)

PB-212 675 PC$10.25/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
COMPREHENSIVE PLAN FOR ST. PETERS, MISSOURI.
Final rept.
Jun 72, 162p MOCOM-PLN-72-0027

Descriptors: (*Urban planning, *Missouri), Economic development, Population growth, Land use zoning, Residential buildings, Streets, Recreation, Urban transportation, Public utilities, Industries, Commercial buildings, Regulations.
Identifiers: *Saint Peters (Missouri).

St. Peters is located in the St. Louis SMSA and is presented with the problem of being one of the fastest growing areas in the country. To effectively prepare for future growth, this Comprehensive Plan was developed. Background studies were undertaken to analyze the following areas: economy, population, existing land use, and housing. With information from these background studies the following major elements were developed: Community Facilities Plan, Park and Recreation Plan, Major Street Plan, and Future Land Use Plan. (Author)

PB-212 676 PC$8.25/MF$0.95
City-County Planning Commission, Rockford, Ill.
PROPOSED ZONING ORDINANCE OF THE CITY OF LOVES PARK.
Final rept.
Sep 72, 122p RWCCPC-72-19
Prepared in cooperation with Rockford-Winnebago County Planning Commission, Ill., and City of Loves Park, Ill.

Descriptors: (*Urban planning, *Illinois), (*Land use zoning, Ordinances), Regulations, Boundaries, Sites, Licenses, Residential buildings, Commercial buildings, Industrial buildings, Recreation, Trailers, Structural design.
Identifiers: *Loves Park (Illinois).

The Zoning Ordinance is a tool to be used in the implementation of the Loves Park Comprehensive Plan. This Ordinance contains a zoning map designating zoning district boundaries and regulations controlling the uses of land; the density of population; the bulk, locations and uses of structures; the areas and dimensions of building sites; and the appearance of certain uses and structures, while at the same time allowing for innovation in site design through Planned Development, Special Administrative Procedures. (Author)

PB-212 677 PC$3.00/MF$0.95
Chicago Mayor's Committee for Economic and Cultural Development, Ill.
THE O'HAREXPRESS: AN EMPLOYMENT ACCESS DEMONSTRATION PROJECT.
Final rept.
Aug 72, 50p UMTA-IL-06-0011-72-1
Contract DOT-UT-186

Descriptors: (*Airports, Access roads), (*Bus lines, Urban transportation), (*Urban transportation, *Illinois), Evaluation, CENTRAL CITY, Employment, Statistical data, Socioeconomic status, Urban planning, Effectiveness.
Identifiers: Ridership, *Employment access, Demonstration projects, *Low income workers, *Chicago (Illinois), Airport accessibility.

The O'Harexpress bus project was designed to make jobs at Chicago's O'Hare International Airport accessible to residents of inner-city neighborhoods. The service operates non-stop between the Jefferson Park rapid transit station and the airport terminal and cargo areas. Planning and implementation of the project are described; the report also contains complete ridership and survey data. The report indicates that numerous low-income workers were able to secure previously inaccessible jobs.

PB-212 686 PC$7.00/MF$0.95
General Planning and Resources Consultants, St. Louis, Mo.
A COMPREHENSIVE REGIONAL PLAN, WARREN COUNTY, ILLINOIS.
Final rept.
Apr 72, 96p GPRC-JG-599-1
Prepared in cooperation with Warren County Regional Planning Commission, Ill.

Descriptors: (*Regional planning, *Illinois), Land use, Agriculture, Residential buildings, Transportation, Urban areas, Rural areas, Policies, Commercial buildings, Industrial buildings, Freeways, Parks, Community development.
Identifiers: *Warren County (Illinois).

The purpose of this report is to analyze the various existing conditions in Warren County, present plan proposals and administrative recommendations. Because the movement in the county is from rural to urban, the agrarian base of the economy will decline. Part of a growing urban character, its potential to attract new industry, residential development, is a part of the change in growth patterns it will experience from new freeway development and urban expansion. (Author)

PB-212 689 PC$9.75/MF$0.95
Missouri Dept. of Community Affairs, Jefferson City.
COMPREHENSIVE PLAN FOR SELIGMAN, MISSOURI.
Final rept.
30 Jun 72, 152p MOCOM-PLN-72-0041

Descriptors: (*Urban planning, *Missouri), Economic development, Population growth, Land use, Residential buildings, Community development, Recreation, Standards.
Identifiers: *Seligman (Missouri).

Seligman is a rural community located in one of the major recreational areas of Missouri. The city was incorporated in the early 1950's and has experienced a small growth in population. However, Barry County has stabilized its population decline and a bright future for both the county and city is indicated. To effectively prepare for future growth, this Comprehensive Plan was developed. Background studies were undertaken to analyze the following areas: economy, population, existing land use, and housing. (Author)

PB-212 705 PC$3.00/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Engineering Projects Lab.
NONLINEAR AND FINITE PAD LENGTH PERFORMANCE OF VEHICLE AIR CUSHION SUSPENSIONS.
Final rept.,
D. N. Wormley, D. P. Garg, and A. B. Boghani.
Feb 72, 130p EPL-72-72966-1 FRA-RT-73-6
Contract DOT-FR-10007

Descriptors: (*Passenger vehicles, Ground effect machines), (*Ground effect machines, *Urban transportation), Suspension systems (Vehicles), Equations of motion, Response, Skirts, Statistical analysis, Performance evaluation, Design standards, Computer programming.
Identifiers: *Air cushion suspensions, Guideways, Flexible skirts.

Nonlinear and small perturbation linear models for the one-dimensional heave motion of a basic flexible-skirted air cushion suspension are formulated. A study of linear and nonlinear model characteristics under transient guideway and external force inputs is conducted to determine over what range of cushion configurations, operating conditions and input disturbance levels a linear model provides a good approximation to the nonlinear cushion model. The performance of a finite pad length suspension on a guideway containing random irregularities is determined. To illustrate the design information resulting from the transiet t performance and finite pad length study, the prototype designs of suspensions for intraurban and intercity vehicles are discussed.

PB-212 710 PC$3.00/MF$0.95
Transport and Road Research Lab., Crowthorne (England).
PRIORITY TO BUSES AS PART OF TRAFFIC MANAGEMENT.
F. V. Webster. 1972, 21p TRRL-LR-448
Presented to the Smyposium on Road Traffic Problems in Ireland, Theme 1: Traffic Management Techniques as an Aid to Urban Transportation,

Descriptors: (*Bus lines, *Traffic engineering), (*Passenger transportation, *Ireland), Project planning, Management engineering, Roads, Scheduling, Optimization, Test facilities, Experimental data, Savings, Effectiveness.
Identifiers: Priorities, Bus lanes.

The report describes a controlled experiment carried out on the laboratory's test track, and gives some results showing how the saturation flow of cars and the time savings to buses are affected by the position of the end of the bus lane relative to the stop-line. Some information is given on the effect of changing the position of bus bays. This experimental work is extended by means of a theoretical simulation of a bus lane, where different degrees of traffic saturation, together with changes in other variables, are dealt with. Some results of this simulation are given which are compared with the results of the track experiment. (Author)

PB-212 712 PC$7.00/MF$0.95
Saginaw County Metropolitan Planning Commission, Mich.
A FUNCTIONALLY INTEGRATED TRANSIT SYSTEM FOR SAGINAW COUNTY, 1970-1990. JOB 508: TRANSIT PLAN.
Narrative rept.
May 72, 99p
Prepared in cooperation with Williams (Clyde E.) and Associates, Inc., South Bend, Ind.

Descriptors: (*Urban transportation, *Public administration), (*Passenger transportation, *Michigan), Reviews, Economic analysis, Financing, Trends, Requirements, Forecasting, Management planning, Questionnaires, Bus lines, Mass transportation.
Identifiers: *Functionally integrated transit systems, *Saginaw County (Michigan).

The report presents a short range and long range plan for implementation by the community to provide for its transit needs during the period 1970-1990. Recommendations are based on previous data assembled under Jobs 223 and 315, Transit Inventory and Analysis, June 1971 and the transit experience of other midwestern medium sized cities.

PB-212 716 PC$3.00/MF$0.95
Puerto Rico Univ., Mayaguez. Water Resources Research Inst.
THE IMPACT OF INDUSTRIAL AND ECONOMIC DEVELOPMENT ON WATER AVAILABILITIES IN SOUTH PUERTO RICO.
Completion rept.,
Dominador G. Pascua. Apr 72, 95p UPRICO-WRRI-PR-72-17-1 W73-00651, OWRR-A-017-PR (2)

Descriptors: (*Water resources, *Puerto Rico), Economic development, Ground water, Benefit cost analysis, Rainfall, Hydrology, Social welfare, Watersheds.

Four subject areas are discussed in the report; namely, Authority and responsibility for water in Puerto Rico; Hydrology of the region of study; Pertinent socio-economic aspects of life; and, Analysis of present water availabilities in the area of study. (Author)

PB-212 717 PC$3.00/MF$0.95
Georgia Inst. of Tech., Atlanta. Environmental Resources Center.
A PROGRAM FOR METROPOLITAN WATER MANAGEMENT.
Completion rept. 15 Apr 70-31 Jul 72,
Gene E. Willeke, and F. William Kroeck. Jul 72, 231p ERC-0772 W73-00937, OWRR-B-038-GA (2)

Descriptors: (*Water resources, Management planning), (*Urban areas, Water supply), Project planning, Financing, Flood control, Waste water, Reservoirs, Water treatment, Storm sewers, Drainage, Recreation, Federal budgets, Georgia, Michigan, South Carolina.
Identifiers: *Water management, Macon (Georgia), Lansing (Michigan), Charleston (South Carolina), Columbia (South Carolina), Greenville (South Carolina).

Study objectives were to describe metropolitan water management; determine strengths and weaknesses of institutional arrangements; evaluate means of financing water programs; and suggest ways management could be improved. Field studies were done in Macon, Georgia, Lansing, Michigan, Charleston, Columbia, and Greenville, South Carolina. Emphasis was placed on differences among areas in terms of physical, economic, and political context. Depth interviewing was employed for 190 public officials, citizen groups, and general informants. Water management included water supply, wastewater management, storm drainage, flood hazard reduction, and recreation. Water management is treated as a social process. Roles of participants, nature of decisions and nondecisions, actions and inactions, functional priorities, intergovernmental relations, management style, and public participation are discussed. (Author)

PB-212 723 PC$3.25/MF$0.95
Southwest New Mexico Council of Governments, Silver City.
LAND USE POLICY STATEMENT.
Jul 72, 22p SWNMCOG-3

Descriptors: (*Regional planning, *New Mexico), (*Land use, Regional planning), Policies, Objectives, Economic development, Sites, Manufacturing, Mines (Excavations), Population growth, Urban areas.
Identifiers: *Catron County (New Mexico), *Hidalgo County (New Mexico), *Luna County (New Mexico), *Grant County (New Mexico).

Preliminary statement of land use policies for Catron, Hidalgo, Luna and Grant Counties in the Southwest New Mexico Planning District No. 5. Historic background of land use in the area, population density now and in the future, ownership of land in the area, statement of goals to be obtained by proper land use planning, location of major manufacturing and mining. Some maps of general area land use and use projection. (Author)

PB-212 729 PC$3.00/MF$0.95
Battelle Columbus Labs., Ohio.
A STUDY TO IDENTIFY OPPORTUNITIES FOR INCREASED SOLID WASTE UTILIZATION. VOLUME I.
Final rept.
1972, 178P* EPA-SW-40D.1-72
Grant G06-EC-00282
Prepared in cooperation with National Association of Secondary Material Industries, Inc., New York, N.Y. See also Volume 2, PB-212 730.

Descriptors: (*Waste disposal, *Materials recovery), (*Metal industry, Materials recovery), (*Paper industry, Materials recovery), (*Textile industry, Materials recovery), Utilization, Scrap, Metal scrap, Waste papers, Textiles, Industries, Marketing, Demand (Economics), Supply (Economics), Economic factors, Aluminum, Copper, Lead, Zinc, Nickel, Stainless steel, Precious metals.
Identifiers: *Solid waste disposal, *Waste recycling, *Metal recycling, *Secondary materials industry, Scrap recycling, Junk car disposal.

The study concerns the development of greater solid waste utilization through analysis of the secondary materials industry, its sources of supply, its consuming markets, and its economic and technological problems. Eight separate materials examined are aluminum, copper, lead, zinc, nickel and stainless steel, precious metals, paper, and textiles. Problems inhibiting increased recycling of these materials are identified, and recommended actions are proposed. A survey of the secondary materials industry was the basis for many of the identified problems and also provided numerous statistics on the scrap industry. Volume 1 provides a brief summary of the other 8 volumes, plus an analysis of activities and recycliag problems common to all of the commodities. Areas of commonality include such matters as legislation and its effect on recycling, and a description of the equipment used in processing secondary materials.

PB-212 730 PC$9.00/MF$0.95
Battelle Columbus Labs., Ohio.
A STUDY TO IDENTIFY OPPORTUNITIES FOR INCREASED SOLID WASTE UTILIZATION. VOLUMES II TO VII.
Final rept.
1972, 608P EPA-SW-40D.2-72
Grant G06-EC-00282
Prepared in cooperation with National Association of Secondary Material Industries, Inc., New York, N.Y. See also Volume 1, PB-212 730 and Volumes 8 and 9, PB-212 731.

Descriptors: (*Waste disposal, *Materials recovery), (*Metal industry, Materials recovery), Utilization, Metal scrap, Industries, Marketing, Demand (Economics), Supply (Economics), Economic factors, Aluminum, Copper, Lead, Zinc, Nickel, Stainless steel, Precious metals.
Identifiers: *Solid waste disposal, *Waste recycling, *Metal recycling, *Secondary materials industry, Scrap recycling, Junk car disposal.

The study concerns the development of greater solid waste utilization through analysis of the secondary materials industry, its sources of supply, its consuming markets, and its economic and technological problems. Volumes 2 thru 7 are included. They deal with aluminum, copper, lead, zinc, nickel and stainless steel, and precious metals.

PB-212 731 PC$6.00/MF$0.95
Battelle Columbus Labs., Ohio.
A STUDY TO IDENTIFY OPPORTUNITIES FOR INCREASED SOLID WASTE UTILIZATION. VOLUMES VIII AND IX.
Final rept.
1972, 342P EPA-SW-40D.3-72
Grant G06-EC-00282
Prepared in cooperation with National Association of Secondary Material Industries, Inc., New York, N.Y. See also Volumes 2 to 7, PB-212 730.

Descriptors: (*Solid waste disposal, *Materials recovery), (*Paper industry, Materials recovery), (*Textile industry, Materials recovery), Utilization, Scrap, Waste papers, Textiles, Industries, Marketing, Demand (Economics), Supply (Economics), Economic factors.
Identifiers: *Solid waste disposal, *Waste recycling, *Secondary materials industry, Scrap recycling.

The study concerns the development of greater solid waste utilization through analysis of the secondary materials industry, its sources of supply, its consuming markets, and its economic and technological problems. The report contains Volumes 8 and 9 which deal with paper and textile recycling.

PB-212 737 PC$16.25/MF$0.95
East Tennessee Development District, Knoxville.
WATER AND WASTEWATER PLAN, ANDERSON, BLOUNT AND KNOX COUNTIES, TENNESSEE. VOLUME I. WATER SUPPLY AND DISTRIBUTION.
Final rept.
Jul 72, 282p ET-SA-18-1-72
Prepared in cooperation with Allen and Hoshall, Consulting Engineers. Memphis, Tenn. See also Volume 2, PB-212 738.

Descriptors: (*Water supply, *Tennessee), (*Water distribution, *Regional planning), Urban areas, Rural areas, Classifications, Standards, Cost engineering, Services, Requirements, Surveys, Evaluation, Recommendations.
Identifiers: *Knoxville (Tennessee), Standard metropolitan statistical areas, Integrated facilities systems, *Blount County (Tennessee), *Knox County (Tennessee).

The report sets forth the planning relative to comprehensive water supplies and distribution systems throughout the Knoxville, Tennessee SMSA by 1990. Investigations of existing water facilities in the Knoxville SMSA are concerned with extensive areas in the SMSA without adequate or dependable water supplies; existing treatment facilities which are too small to be considered in a comprehensive water system; and wide variations in the standards of the different utilities. Forecasts of future water requirements indicate that the present surface water sources are adequate to supply these requirements. Guide-line standards are set forth and priorities for providing the recommended improvements are established, with consideration being given to timing and financing of the recommended improvements. Capital improvements programs are presented for each development stage.

PB-212 738 PC$10.75/MF$0.95
East Tennessee Development District, Knoxville.
WATER AND WASTEWATER PLAN, ANDERSON, BLOUNT AND KNOX COUNTIES, TENNESSEE. VOLUME II. WASTEWATER COLLECTION AND TREATMENT.
Final rept.
Jul 72, 171p ET-SA-18-2-72
Prepared in cooperation with Allen and Hoshall, Consulting Engineers. Memphis, Tenn. See also Volume 1, PB-212 737.

Descriptors: (*Water services, *Tennessee), (*Waste water, *Regional planning), Collecting methods, Water treatment, Facilities, Requirements, Forecasting, Design standards, Inventories, Project planning, Recommendations.
Identifiers: *Knoxville (Tennessee), Standard metropolitan statistical areas, Integrated facilities systems, *Blount County (Tennessee), *Knox County (Tennessee).

The report sets forth the planning relative to the provision of collection and treatment facilities to meet the wastewater needs in the Knoxville, Tennessee SMSA through 1990. At the present time, wastewater service is available principally within municipal limits, in the more densely inhabited areas of certain utility districts, and to a few remote industrial sites. General inventories of all existing wastewater systems are presented. Many areas served by septic tank installations have soils unsuitable for proper septic tank operation. Forecasts of future wastewater needs through 1990 indicate that additional collection and treatment facilities will be required. Integrated wastewater systems are developed for each county in two stages through 1990. Priorities for providing the recommended improvements are established, with consideration being given to timing and financing of the recommended improvements.

PB-212 740 PC$3.75/MF$0.95
California Univ., Los Angeles. School of Architecture and Urban Planning.
PHYSICAL ACCESSIBILITY AS A SOCIAL INDICATOR.
Research rept. 1971-72,
Martin Wachs, and T. Gordon Kumagai. 20 Oct 72, 42p* UMTA-CAL-11-0009-72-16
Contract DOT-UT-425

Descriptors: (*Urban transportation, Planning), Availability, Socioeconomic status, Employment, Services, Public health, Travel time.

A discussion is presented of the ways in which accessibility to employment and urban services constitutes an important measure of the quality of urban living, and how accessibility might, therefore, be included as an important component of a 'social report' for a city or region. A conceptual framework is presented for measuring accessibility in terms of the ease with which citizens may reach a variety of opportunities for employment and services. This framework is interpreted as an approach to evaluating transportation and regional plans which differs from approaches based upon travel volumes and travel times which are currently employed in urban transportation planning and evaluation. The use of the proposed measures of accessibility is illustrated with data on accessibility to employment and health care facilities in Los Angeles, and these data are interpreted to illustrate differences as a function of location and socioeconomic status. (Author)

PB-212 743 PC$3.00/MF$0.95
Maine State Highway Commission. Materials and Research Div.
A SIMULATED APPLICATION OF STATISTICAL QUALITY ACCEPTANCE SPECIFICATIONS FOR BITUMINOUS PAVEMENTS.
Final rept. 1969-70,
Philip B. Day, and David Rand. Jun 71, 90p
Technical paper-71-6p

Descriptors: (*Flexible pavements, Specifications), (*Bitumens, Flexible pavements), Statistical analysis, Acceptability, Quality, Evaluation, Mixtures, Simulation, Analysis of variance, Maine.

The report covers the application of oriented specifications to an actual project. The statistical acceptance tests were run completely separate from the control tests which were used to actually govern the production of the mix. An analysis of the variance between the control and the Maine statistical acceptance testing procedures, for the entire project, indicates a very high degree of probability exists that the results are from the same population. As a result of this study and comparison a revised set of Statistical Quality Acceptance Specifications is presented. (Author)

PB-212 752 PC$11.25/MF$0.95
Council on Intergovernmental Relations, Sacramento, Calif.
MONTEREY PENINSULA AREA PLAN.
Aug 72, 182p CIR-1004.08-01
Prepared in cooperation with Monterey County Planning Commission, Salinas, Calif. and Hahn, Wise and Associates, Inc.

Descriptors: (*Regional planning, *California), Objectives, Economic development, Recreational facilities, Land use, Streets, Population growth, Residential buildings, Commercial buildings, Topography, Coasts, Hazards.
Identifiers: *Monterey Peninsula (California), *Monterey County (California).

The report is the result of the cooperative effort by the Citizen's Committee, The Cities on the Monterey Peninsula, The Monterey Peninsula Area Planning Commission and the Monterey County Planning Commission of California. This report sets out the Goals and Objectives of the area, Principles and Standards for Planning, and planning and environmental analysis. A map showing the General Plan Elements is the key exhibit of the report. Included are the basic data to develop the Plan, such as, Existing Land Use, Streets, Recreation, Community Values, Population Projections and Hazards. (Author)

PB-212 764 PC$4.75/MF$0.95
Saginaw County Metropolitan Planning Commission, Mich.
MODEL SUBDIVISION REGULATION ORDINANCE: JOB 601.
Feb 72, 51p

Descriptors: (*Regional planning, *Michigan), (*Land use zoning, Ordinances), Standards, Boundaries, Specifications, Law (Jurisprudence), Right of way acquisition, Law enforcement, Penalties.
Identifiers: *Saginaw County (Michigan), Subdivision regulations.

The Model Subdivision Ordinance, prepared for those municipalities in Saginaw County with Planning Commissions, specifies standards for the layout and construction of new developments; details procedures to be followed in the processing

of a proposed plat, based upon the Subdivision Control Act of 1967; and establishes the means of administration and enforcement. (Author)

PB-212 765 PC$10.25/MF$0.95
Saginaw County Metropolitan Planning Commission, Mich.
MODEL ZONING ORDINANCE: JOB 601.
Mar 72, 161p

Descriptors: (*Regional planning, *Michigan), (*Land use zoning, Ordinances), Regulations, Residential buildings, Industrial buildings, Commercial buildings, Boundaries, Agriculture, Parking facilities, Parks, Licenses, Law enforcement.
Identifiers: *Saginaw County (Michigan).

It is the purpose of this 'work paper' to provide model zoning regulations. This narrative provides a framework within which a local zoning ordinance may be constructed or amended. Specifically, a model zoning ordinance is presented as a vehicle to implement the areawide land use plan for Saginaw County. (Author)

TT-70-50098/4-6 PC$3.00/MF$0.95
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
BULLETIN OF CIVIL ENGINEERING. VOLUME 31, NUMBER 4-6, APRIL-JUNE 1969.
1972, 276p
Trans. of Byulletin Stroitelnoi Tekhniki (USSR) v31 n4/6 Apr-Jun 69. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Civil engineering, *USSR), Construction, Buildings, Prefabrication, Construction equipment, Steel structures, Design criteria, Geodetic surveys, Seismology.

Contents:
- The development of factory-made three-dimensional units for use in the construction of houses;
- Standard steel structures for flat roofs of buildings in seismic regions and for buildings with traveling cranes;
- A new semikilled steel grade for steel structures;
- Technical assistance at Siberian construction sites;
- Auxiliary materials for the design of floors for industrial buildings;
- Geodetic-survey work in construction;
- Greater economy in the consumption of cement in construction.

TT-70-50098/7-9 PC$3.00/MF$0.95
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
BULLETIN OF CIVIL ENGINEERING, VOLUME 31, NUMBER 7-9, JULY-SEPTEMBER 1969.
1972, 241p
Trans. of Byulleten Stroitelnoi Tekhniki (USSR) v32 n7/9 Jul-Sep 69. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Civil engineering, *USSR), Construction, Residential buildings, Building codes, Industrial buildings, Design criteria, Reinforced concrete, Prefabrication.

Contents:
- Improving the planning of capital construction and economic stimulation of construction;
- Improving design and cost estimates;
- Measures for improving the quality of housing and civic construction;
- Improving the quality of the design and building of towns;
- Instruction regarding the procedure for working out and ratifying building standards and specifications;
- Prefabricated reinforced-concrete trusses for the roofing of flat-roof buildings.

TT-71-50056/4-6 PC$3.00/MF$0.95
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
BULLETIN OF CIVIL ENGINEERING. VOLUME 32, NUMBER 4-6, APRIL-JUNE 1970.
1972, 263p
Trans. of Byulleten Stroitelnoi Tekhniki (USSR) v32 n4/6 Apr-Jun 70. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Information Program.

Descriptors: (*Civil engineering, *USSR), Construction, Buildings, Design criteria, Reinforced concrete, Pile structures.

Contents:
- Steps toward setting up plants for the manufacture of aluminum articles for construction;
- Methods of field testing piles and pile casings;
- Clarifying remark on design specifications for the corrosion protection of structures;
- The importance of quality in precast reinforced concrete;
- Procedure for drawing up designs and estimates for residential and civic construction projects;
- Reinforced-concrete roofing beams without cross-bracing for corrosive atmospheres;
- Vibration-insulating installations for foundations and bases under machines producing dynamic loading;
- Prestressed reinforced-concrete plates for the surfacing of airfields.

TT-71-50056/7-9 PC$3.00/MF$0.95
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
BULLETIN OF CIVIL ENGINEERING. VOLUME 32, NUMBER 7-9, JULY-SEPTEMBER 1970.
1972, 248p
Trans. of Byulleten Stroitelnoi Tekhniki (USSR) v32 n7/9 Jul-Sep 70. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Civil engineering, *USSR), Construction, Design criteria, Building codes, Reinforced concrete, Bridges, Highways, Airports, Earthquakes, Construction equipment.

Contents:
- Unified system of reference and information centers for civil engineering and architecture;
- Wider use of converter-oxygen-steel reinforcement in bridges and pipes;
- New design standards for airport pavements;
- Timber doors for industrial plant buildings;
- Construction in earthquake regions;
- Foundations for compressors;
- Use of economical rolled stock in construction;
- Faster technical progress in rural construction;
- Ways of using effective construction materials and structures.

13C. Construction Equipment Materials, and Supplies

AD-750 356 PC$3.00/MF$0.95
Army Construction Engineering Research Lab Champaign Ill
FRACTURE MECHANICS APPLICABILITY TO PORTLAND CEMENT CONCRETES,
Dan Jay Naus. 1972, 16p

Descriptors: (*Concrete, Fracture (Mechanics)), Crack propagation, Loading (Mechanics), Deformation, Elasticity, Defects (Materials), Stresses, Strain (Mechanics), Thickness.
Identifiers: *Portland cements.

The applicability of linear-elastic fracture mechanics to cement paste, mortar, and concrete was determined by the fabrication, testing, and analysis of plate specimens, each containing a precast flaw and loading hole extending through the thickness of the specimen and located at the center of the specimen. A rigid plastic cracked strip model was developed to provide an estimate of the microcracking zone that exists in the region of a crack tip in cement paste, mortar or concrete. The experimental results were correlated with the model. (Author)

AD-750 492 PC$8.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
CALCULATION OF BENT, HEAT-RESISTANT, PRESTRESSED REINFORCED CONCRETE ELEMENTS (EXAMPLES OF THE CALCULATION),
A. F. Milovanov, V. A. Shuvalov, and T. N. Malkina. 28 Jul 72, 118p Rept no. FTD-MT-24-1915-71
Edited machine trans. of mono. Raschet Izgibaemykh Zharostoikikh Predvaritelno Napryazhennykh Zhelezobetonnykh Elementov (Primery Rascheta) Moscow, 1969 p1-81, by Robert D. Hill.

Descriptors: (*Reinforced concrete, Structural properties), (*Heat-resistant materials, Reinforced concrete), Flexural strength, Deflection, Deformation, Tensile properties, Shrinkage, Heating, Steel, Iron, Creep, Stresses, Bending, USSR.
Identifiers: Translations, Prestressed concrete, Reinforcing steels.

Stated in the book are basic calculations of rectangular bent heat-resistant prestressed reinforced concrete elements with one-way reinforcement, intended for operation under conditions of high temperatures.

AD-750 997 PC$3.25/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
HARDENING SAND WITH CARBAMIDE RESINS,
S. D. Voronkevich, and E. N. Ogorodnikova. 1 Sep 72, 21p Rept no. FTD-HC-23-1190-72
Edited trans. of Voprosy Inzheneroi Geologii i Gruntovedeniya (USSR) n2 p349-360 1968.

Descriptors: (*Sand, Bonding), (*Construction materials, Flexural strength), Amino plastics, Interactions, Compressive properties, Aging (Materials), Alcohols, Cements, Quartz, Test methods, USSR.
Identifiers: Translations.

Factors affecting bonding strength between artificial cement and sand grains in strengthened sands are considered in detail. Pure quartz sand and sands with ferruginous films strengthened by urea HCHO resins (48, 36, and 24% H2O solns. are tested) (as a hardener, a 50% HCl solution was used). For estimation of resin sand interaction, the moistening method was successfully used. Resin H2O solution moistened the sands poorly. Some moistening improvement was observed on introduction of small amounts (similar to 1%) of FeCl3 and furturyl alc. into the sand resin system. (Author)

PB-212 589 PC$6.75/MF$0.95
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
EVALUATION OF A MULTI-FUNCTIONAL MACHINE FOR USE IN SANITARY LANDFILL OPERATIONS IN SPARSELY POPULATED AREAS.
Final rept.,
V. L. Hammond. 1972, 218p* EPA-SW-39d-72
Grant G06-EC-00210

Descriptors: (*Earth handling equipment, Evaluation), (*Waste disposal, *Earth fills), Front end

loaders, Bulldozers, Soil compacting, Chassis, Overhauling, Benefit cost analysis, Idaho, Oregon.
Identifiers: *Solid waste disposal, Sanitary landfills.

The report gives details of an investigation made of a multi-functional machine, known as the Multi-Mover, which was originally designed to perform the functions of a crawler tractor/dozer, dump truck, compactor, and loader. Its performance in accomplishing sanitary landfill and earthmoving operations was evaluated at several sites in Idaho and Oregon to determine its effectiveness both absolutely and in comparison with crawler tractors in compacting waste and soil cover material, excavating and spreading soil cover, and distributing refuse for compaction. Since the machine is a rubber-tired vehicle that can move over highways under its own power, its use at scattered sites in a sparsely populated area was also evaluated. The advantages and disadvantages that result from the basic concept of a multi-functional machine are presented, the economics of purchase and operation are analyzed, and certain modifications are recommended. (Author)

13D. Containers and Packaging

AD-750 770 PC$3.00/MF$0.95
Swift and Co Oak Brook Ill Research and Development Center
RELIABILITY OF FLEXIBLE PACKAGING FOR THERMOPROCESSED FOODS UNDER PRODUCTION CONDITIONS. PHASE I: FEASIBILITY.
Technical rept.,
D. D. Duxbury, P. F. Sams, W. F. Howeler, J. H. Gee, and W. N. Miller. Jul 70, 248p USA-NLABS-TR-72-77-GP
Contract DAAG17-69-C-0160
Prepared in cooperation with Pillsbury Co., Minneapolis, Minn., Continental Can Co., Chicago, Ill., FMC Corp., Santa Clara, Calif., and Riegel Paper Corp., Rockford, Ill.

Descriptors: (*Food, *Packaging), Packing materials, Processing, Heat, Sealing compounds, Feasibility studies, Quality control, Reliability.

The objective of the two phases of effort under this contract was to establish that thermoprocessed foods in flexible packages can be readily produced under production conditions. Investigations in Phase I, encompassing analytical studies and bench model and special equipment testing, have established that the objective is feasible. Progression to the confirming engineering, line fabrication, and production phase is recommended. Proposed product guideline formulas were revised to meet commercial production requirements. These were approved and commercial production guides were prepared for all seventeen food items. Packaging material and packaging systems specifications were established. Technical feasibility of pouch forming, filling, vacuum sealing, and processing has been established within the constraints of the developed bench model system. Quality assurance testing methodology has been established. (Author)

AD-750 909 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
A STUDY TO IMPROVE THE PRESENT METHOD OF REPORTING AND ANALYZING PACKAGING DEFICIENCIES.
Master's thesis,
Jose L. Miranda Ortiz, and Warren R. Nabours. 15 Sep 72, 158p Rept no. SLSR-7-72B

Descriptors: (*Packaging, Reviews), (*Logistics, Packaging), Military requirements, Reports, Analysis, Damage assessment, Management planning, Theses.

Military packaging plays an important role in all the functions of logistics. An effective packaging deficiency reporting and analysis system is necessary for the optimum management of packaging activities. A review, description, and an analysis were undertaken to improve the present packaging deficiency reporting and analysis methodology. The limiting dimensions which have an impact upon effective packaging deficiency reporting and analysis were outlined. A proposed reporting device was recommended to simplify, facilitate, and mechanize the packaging deficiency reporting process. Different management techniques that could be used to analyze packaging deficiencies at command levels were presented. (Author)

PB-212 505 PC-GPO/MF$0.95-NTIS
Bureau of Mines, Washington, D.C.
BIN HOPPER ENGINEERING AND BULK MATERIALS FLOW: A STATE-OF-THE-ART REPORT ON EMPIRICAL AND THEORETICAL ANALYSES.
Information circular,
W. G. Pariseau, and R. S. Fowkes. Sep 72, 41p BuMines-IC-8552
Prepared in cooperation with Bureau of Mines, Pittsburgh, Pa. Pittsburgh Mining and Safety Research Center.
Paper copy available from GPO $0.45 as stock no. SN-2404-01167, catalog no. I28.27:8552.

Descriptors: (*Hoppers, *Open channel flow), (*Bulk handling, Hoppers), Reviews, Bins, Solids flow, Materials handling, Gravity conveyors, Mining engineering.

An evaluation of the state of knowledge about gravity flow of bulk materials from bin hoppers is made. The requirements for flow to be initiated and to continue, formulas that have been developed experimentally or mathematically from various assumptions to describe the materials flow, and the question of whether or not a material will flow over the entire cross-sectional area of the bin hopper according to the flow regime developed are the primary areas discussed. (Author)

13E. Couplings, Fittings, Fasteners, and Joints

N72-28506 PC$4.00/MF$0.95
Naval Research Lab., Washington, D.C. Ocean Materials Criteria Branch.
CHARACTERIZATION OF GTA WELDMENTS IN 10NI-8CO-2CR-1MO STEEL.
F. R. Stonesifer, and H. L. Smith. Jun 72, 36p
NASA-CR-127693, NRL-MR-2466
NASA ORDER C-54542-B

Descriptors: *Fracture strength, *Hardness, *Impact strength, *Metallography, *Steels, *Tensile properties, *Weld strength, Cobalt alloys, Mechanical properties, Molybdenum alloys, Nickel alloys.

For abstract, see STAR 10 19.

13F. Ground Transportation Equipment

PB-212 468 PC$3.00/MF$0.95
Grumman Aerospace Corp., Bethpage, N.Y.
TRACKED AIR CUSHION RESEARCH VEHICLE SUBSYSTEM DEVELOPMENT TEST REPORT, AERODYNAMIC,
J. Helgesen. Mar 71, 62p PMT-B4-R71-12 FRA-RT-72-31
Contract DOT-FR-00005

Descriptors: (*Tracked vehicles, Aerodynamic forces), (*Ground effect machines, Tracked vehicles), (*Rapid transit railways, *Passenger transportation), Wind tunnel models, Pressure drag, Lift, Pressure distribution, Chassis, Nacelles, Dynamic pressure.
Identifiers: *TACV (Tracked Air Cushion Vehicles), *Tracked air cushion vehicles, Test vehicles, Guideways.

A 1/10 scale model of the Grumman Tracked Air Cushion Research Vehicle (TACRV) was tested in the Grumman Low Speed Wind Tunnel for purposes of obtaining aerodynamic force and moment data on the total vehicle and individually on the body and chassis, and to obtain additional insight into the flow simulation requirements for high-speed tracked air cushion vehicles. This report presents the results of the tests. (Author)

PB-212 469 PC$3.00/MF$0.95
Grumman Aerospace Corp., Bethpage, N.Y.
TRACKED AIR CUSHION RESEARCH VEHICLE AERODYNAMIC ANALYSIS,
J. Pierson, and J. Helgesen. Mar 71, 76p PMT-B4-R71-06 FRA-RT-72-32
Contract DOT-FR-00005

Descriptors: (*Tracked vehicles, Aerodynamic characteristics), (*Ground effect machines, Tracked vehicles), (*Rapid transit railways, *Passenger transportation), Wind tunnel models, Pressure drag, Lift, Pressure distribution, Chassis, Nacelles, Dynamic pressure.
Identifiers: *TACV (Tracked Air Cushion Vehicles), *Tracked air cushion vehicles, Test vehicles, Guideways.

Basic aerodynamic coefficients for the Tracked Air Cushion Research Vehicle (TACRV) are developed by analysis of data obtained during wind tunnel tests of a 1/10 scale model. (Author)

PB-212 470 PC$3.00/MF$0.95
Grumman Aerospace Corp., Bethpage, N.Y.
TRACKED AIR CUSHION RESEARCH VEHICLE SUBSYSTEMS ANALYSIS,
A. Schlosser. Mar 71, 213p* PMT-B4-R71-08 FRA-RT-72-33
Contract DOT-FR-00005

Descriptors: (*Ground effect machines, *Tracked vehicles), (*Rapid transit railways, *Passenger transportation), Experimental design, Mechanical guides, Electric propulsion, Induction motors, Vehicular tracks, Turbofan engines, Chassis, Electric power distribution, Control equipment, Design criteria, Performance evaluation.
Identifiers: *TACV (Tracked Air Cushion Vehicles), *Tracked air cushion vehicles, Test vehicles, Guideways, LIM (Linear Induction Motors), Linear induction motors.

The TACRV is composed of a body containing the cabin, equipment compartment and air supply engines, and a chassis which has ducts to distribute the air to the cushions. The vehicle has secondary suspensions between the body and chassis, and between the chassis and air cushions. Two propulsion modes are available, the Linear Induction Motor (LIM) Propulsion System and the Aeropropulsion System. This report describes the selection, sizing and installation of the air supply system air cushions, secondary suspension, braking system, environmental control system and electric, hydraulic, and pneumatic power systems. The LIM, and TACRV electric propulsion thruster currently being developed under a separate DOT contract, is described along with its performance and salient features. (Author)

PB-212 471 PC$6.00/MF$0.95
National Motor Vehicle Safety Advisory Council, Washington, D.C.
STANDARDIZATION OF AUTOMOTIVE DIAGNOSTIC SYSTEMS.
Jul 72, 429p* DOT-HS-820 212
International Congress on Automotive Safety (1st) 17-19 Jul 72.

Descriptors: (*Automobiles, Inspection), Standardization, Safety, Motor vehicles, Legislation, Test equipment, Proceedings.
Identifiers: *Automotive diagnostic systems.

The report contains papers on system concepts, candidate automotive systems for diagnosis, diagnostic techniques, standardization of automotive diagnostic systems, and panel - future diagnostic programs. In addition to providing the 22 technical papers these proceedings include general information on the National Motor Vehicle Safety Advisory Council, general safety laws, and the legislative history of standardization of automotive diagnostic systems.

PB-212 479 PC$3.00/MF$0.95
Stevens Inst. of Tech., Hoboken, N.J. Davidson Lab.
A TRUCK AND BUS TIRE USE PATTERN STUDY.
Final rept.,
I. E. Ehrlich, I. O. Kamm, M. P. Jurkat, and T. H. Jackson. Dec 71, 131p SIT-DL-71-1573 DOT-HS-800 665
Contracts FH-11-6090, NBS-142-70

Descriptors: (*Tires, Surveys), (*Traffic safety, Tires), Buses (Vehicles), Trucks, Treads, Pressure, Wear, Loads (Forces), Sampling.
Identifiers: Tire use surveys.

A survey was performed in which pressure, loading, tread depth and condition of tires was determined for 5300 truck tires on the road and 400 truck and bus tires in truck terminals. The most significant results of the road survey are the following: 4.3 percent of all tires were found underpressured and 11 percent overloaded; 3.4 percent had major damage; 5 percent were below minimum tread depth. (Author)

PB-212 502 PC$3.00/MF$0.95
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
CHARACTERISTICS OF A LINEAR REGULATION CONTROL LAW FOR VEHICLES IN AN AUTOMATIC TRANSIT SYSTEM.
Final rept.,
S. J. Brown, Jr. Jan 72, 91p* APL/JHU-CP-009/TPR-020 UMTA-MD-06-0011-72-1
Contract DOT-UT-109

Descriptors: (*Passenger vehicles, *Automatic control), Mathematical models, Velocity, Spacing, Stopping, Wind pressure, Analysis of variance.
Identifiers: *Single car follower regulation system, Guideways, Emergency stopping distances.

Automatic speed and headway regulation of closely spaced vehicles by use of a linear single-car-follower control law is examined. Performance criteria are identified and formulated as algebraic relations for controller gains applied to both the vehicle's tachometer feedback and to inputs representing the relative velocity and the spacing variation between vehicles. A parameter using the ratio of stopping distance of a vehicle under control to the emergency stopping distance is discussed. It is shown that design criteria are dependent on knowledge of the vehicle loading and the velocity of headwinds encountered during operation.

PB-212 506 PC$3.00/MF$0.95
Transport and Road Research Lab., Crowthorne (England).
DEVELOPMENT OF A PROGRAM FOR THE AXLE-LOAD SURVEY RECORDER (ALSER).
C. J. D. Lane, and J. G. Dennis. 1972, 16p TRRL-LR-478

Descriptors: (*Punched tape readers, *Computer programming), (*Recording instrument papers, Punched tape readers), (*Axles, Loads (Forces)), Data recorders, Tape recorders, Punched tapes, Control sequences, Vehicular traffic, Flow charting, Great Britain.
Identifiers: ALSER (Axle Load Survey Recorders), Axle load survey recorders, Alser computer program, RATTLE computer program, Tape analysis, FORTRAN, FORTRAN 4 programming language.

The report describes a FORTRAN program for analysing the data tapes produced by the portable Axle Load Survey Recorder developed by the Laboratory. The main purpose of the program ALSER is to compose the survey data into a suitable format for analysis by RATTLE, an independently written tabulation program. With minor adaptations the ALSER program could be used with other commonly available tabulation programs. (Author)

PB-212 535 PC$3.00/MF$0.95
Scientific Analysis Corp., San Francisco, Calif.
STEAM BUS SYMPOSIUM PROCEEDINGS, NOVEMBER 17, 1971, WASHINGTON, D.C.
17 Nov 71, 88p* UMTA-CAL-06-0031-71-1
Contract DOT-UT-124

Descriptors: (*Buses (Vehicles), *Steam engines), (*Urban transportation, Buses (Vehicles)), Meetings, Urban transportation, Rankine cycle, Exhaust emissions, Air pollution control equipment.
Identifiers: Air pollution abatement.

The report contains the proceedings of a symposium on steam bus technology held in Washington, D.C., on November 17, 1971. The principal advantage of external combustion propulsion is pollution-free operation, a critical requirement for urban transit vehicles under such emission-control standards as those imposed by the California Pure Air Act. Government spokesmen at the symposium represented the U.S. Department of Transportation, the Urban Mass Transportation Administration, and the Environmental Protection Agency (EPA). Other speakers discussed the 'EPA Rankine Cycle Program,' the 'Role of the California Legislature' in passing landmark emission-control legislation, and 'Cobustor Research and Emission Goals.' In addition, steam bus designs produced by Steam Power Systems, Inc., William M. Brobeck and Associates, Lear Motors Corporation, and Vought Aeronautics Company are described.

PB-212 545 PC$4.75/MF$0.95
East Tennessee Development District, Knoxville.
KNOXVILLE METROPOLITAN AREA MAJOR ROAD PLAN.
Preliminary rept.
Jun 72, 51p ET-SA-17
See also PB-212 544.

Descriptors: (*Urban transportation, *Tennessee), (*Roads, Urban planning), Objectives, Transportation, Classifying, Rural areas, Urban areas, Volume, Predictions, Improvement, Construction, Maintenance, Streets, Freeways, Expressways.
Identifiers: *Knoxville (Tennessee).

The report sets forth the goals and objectives, backgorund data, definitions, and a recommended functional classification plan to serve the forecasted 1991 population, the 1991 Knoxville Metropolitan Area Land Use Plan, and the forecasted 1991 traffic. The report emphasizes an orderly system of freeways, expressways, arterials and collectors predicated on the transportation goals and objectives, for the Knoxville Metropolitan Area. (Author)

PB-212 594 PC$3.00/MF$0.95
Dynamic Science, Phoenix, Ariz.
REAR END STRUCTURAL CRASHWORTHINESS OF PERIMETER FRAME VEHICLES. DESIGN DEVELOPMENT AND VERIFICATION.
Final rept., Jul 70-Jul 72,
R. L. Anderson, and E. Enserink. Jul 72, 294p*
2310-72-18 DOT-HS-800 697
Contract FH-11-7604

Descriptors: (*Passenger vehicles, *Collision research), (*Crash tests, *Frames), Structural design, Impact tests, Test facilities, Data acquisition, Design standards, Model tests, Revisions, Information systems, Recommendations.
Identifiers: *Crashworthiness, *Vehicle rear ends.

The objective of the program was to develop a rear end structure with improved crash energy control characteristics for late-model perimeter frame American-built automobiles. Baseline impact tests were conducted to determine the performance characteristics of conventional automobiles in rear end impacts and to provide a basis for later evaluation of the modified vehicles. Scale model dynamic tests were conducted in a parametric study of various energy management concepts. Two basic designs and three vehicles were investigated in a series of full-scale development tests.

PB-212 687 PC$3.00/MF$0.95
Massachusetts Bay Transportation Authority.
STANDARD LIGHT RAIL VEHICLE SPECIFICATION. CONTRACT SECTION.
Final rept.
Oct 72, 86p UMTA-MA-06-0015-72-1
Prepared in cooperation with San Francisco Municipal Railway Improvement Corp., Calif. See also PB-212 688.

Descriptors: (*Railroad cars, *Contract administration), (*Urban transportation, *Rapid transit railways), Contracts, Proposals, Performance evaluation, Construction management, Contract terms, Negotiations, Spare parts, Contractors, Contracted services.
Identifiers: *Light rail vehicles.

The specification describes a standard United States Light Rail Vehicle. Performance parameters and design characteristics contained in this specification were developed in cooperation with mass transit operators, consulting engineers, and the Urban Mass Transportation Administration. The overall specification is divided in two sections which detail contractural procedures and technical specifications for the manufacture of the light rail vehicle. The report, the contract section, contains information for bidders and other relevant documentation.

PB-212 688 PC$3.00/MF$0.95
Massachusetts Bay Transportation Authority.
STANDARD LIGHT RAIL VEHICLE SPECIFICATION. TECHNICAL SECTION.
Final rept.
Oct 72, 286p UMTA-MA-06-0015-72-2
Prepared in cooperation with San Francisco Municipal Railway Improvement Corp., Calif. See also PB-212 687.

Descriptors: (*Railroad cars, *Specifications), (*Urban transportation, *Rapid transit railways), Design criteria, Chassis, Vehicle wheels, Suspension systems (Vehicles), Equipment specifications, Materials specifications, Performance evaluation, Engineering standards, Electric propulsion.
Identifiers: *Light rail vehicles.

The specification describes a standard United States Light Rail Vehicle. Performance parameters and design characteristics contained in this specification were developed in cooperation with mass transit operators, consulting engineers, and the Urban Mass Transportation Administration. The overall specification is divided in two sections which detail contractural procedures and technical specifications for the manufacture of the light rail vehicle. The report, the technical section, contains comprehensive design specifications for all vehicle components.

PB-212 756 PC$3.00/MF$0.95
Minicars, Inc., Goleta, Calif.
IMPROVED AIR BAG RESTRAINTS FOR FRONT SEAT COMPACT CAR OCCUPANTS. VOLUME I, EXECUTIVE SUMMARY.
Final rept.,
D. Friedman, H. A. Wilcox, A. Jordan, and N. DiNapoli. Jul 72, 22p* DOT-HS-800 711
Contract DOT-HS-113-1-163
See also Volume 2, PB-212 757.

Descriptors: (*Automobiles, *Safety devices), Motor vehicle accidents, Inflatable structures, Constraining, Tests.
Identifiers: *Air bag restraint systems, *Compact cars.

The report summarizes the effort to develop an improved passive restraint. The objective was to apply maximum tolerable deceleration to the occupant so as to achieve the highest possible safe vehicle crash velocity for future 'crashworthiness-modified' compact cars. The result of the work was the advanced development of a passive (non-air bag type) restraint such that at a complexity level equivalent to three seat buckles and belts, a door hinge and latching mechanism, some foam and appropriate structural attachments, controlled deceleration of front seat occupants within acceptable injury criteria limits can be provided in 40 to 45 mph impacts; and with some increase in complexity level, the occupant can be similarly protected at any speed for which compartment intrusion can be reasonably controlled. (Author)

PB-212 757 PC$6.00/MF$0.95
Minicars, Inc., Goleta, Calif.
IMPROVED AIR BAG RESTRAINTS FOR FRONT SEAT COMPACT CAR OCCUPANTS. VOLUME II. FINAL PROGRAM REPORT.
Final rept.,
D. Friedman, H. A. Wilcox, A. Jordan, and N. DiNapoli. Jul 72, 179p DOT-HS-800 712
Contract DOT-HS-113-1-163
See also Volume 1, PB-212 756.

Descriptors: (*Automobiles, *Safety devices), Motor vehicle accidents, Inflatable structures, Constraining, Tests.
Identifiers: *Air bag restraint systems, *Compact cars.

The volume details the iterative design, development, and test program of the restraint system.

13G. Hydraulic and Pneumatic Equipment

AD-750 369 PC$3.00/MF$0.95
Military Academy West Point N Y Dept of Mechanics
THE FREQUENCY RESPONSE OF A PNEUMATIC TEE JUNCTION,
Frank J. Redd, and Frank Cardile. 1972, 13p

Descriptors: (*Fluid amplifiers, Mathematical models), Fluid flow, Response, Wave transmission.
Identifiers: Fluerics, Frequency response.

The paper compares data obtained from an experimental analysis of the frequency response of a pneumatic tee junction to analytical curves resulting from an ideal, acoustic, one dimensional analysis.

AD-750 497 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE INVESTIGATION OF STRESSES IN A COMPRESSOR BLADE FOIL,
V. B. Gorlov. 4 Aug 72, 11p Rept no. FTD-MT-24-12-72
Edited machine trans. of Vsesoyuznoi Konferentsii, (5th) n.p., 23-27 Jun 64. Polyarizatsionno-Opticheskii Metod Issledovaniya Napryazhenii. Trudy (All-Union Conference (5th) n.p., 23-27 Jun 64. Polarization-Optical Method of Studying Stresses. Transactions) Leningrad, 1966 p330-334, by Bernard L. Tauber.

Descriptors: (*Compressor blades, Strain (Mechanics)), Stresses, Torsion, Joints, Statistical distributions, Model tests, Alloys, Test methods, Optical equipment, Loading (Mechanics), USSR.
Identifiers: Polarization optical method, Translations.

The paper contains the results of an investigation of stresses in compressor rotors and blades. Specifically, the stresses in dove tail joints (two dimensional problem) and the key end of a compressor blade with a considerable natural twist (three dimensional problem) were evaluated. A model of the rotor was constructed using a special alloy. The stresses between the blade slots on the rotor were measured using an optical polarization method. The distortion of a grid pattern after the test was used to measure the strain. (Author)

AD-750 629 PC$3.00/MF$0.95
Honeywell Inc St Paul Minn Research Dept
ADAPTATION OF FLUIDIC CONTROL TECHNOLOGY TO MISSILE HARDWARE MANUFACTURING.
Final rept. 15 Dec 69-30 Jan 71,
John M. Zabsky, James L. Brown, Fred W. Merrill, and Marc W. Whittlesey. Jun 71, 195p
Rept no. 12179-FR QL-TR-71-3
Contract DAAH03-69-C-0481

Descriptors: (*Guided missile components, *Manufacturing methods), Fluidics, Machine shop practice, State-of-the-art reviews, Fluid amplifiers, Control systems, Automation, Production control, Machine tools.
Identifiers: *Fluerics, Evaluation.

The report focuses on applying fluidic control technology to missile hardware production. Results from literature searches, mail surveys, and the observation of production processes in industry established the status of fluidics as an important control technology. By investigating several missile hardware production lines, 12 candidate systems using fluidic controls are evaluated. The evaluation concerns the predicted performance over the present operation, the consideration of advantages and benefits, and the expansion of the system into commonality areas. (Author)

AD-750 931 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
CALCULATION OF THE DISTRIBUTION OF LOSSES OVER THE SPAN OF AN AXIAL--FLOW COMPRESSOR BLADE,
V. S. Beknev, and V. Yu. Kozhevnikov. 2 Aug 72, 13p Rept no. FTD-MT-24-245-72
Edited machine trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Mashinostroenie (USSR) n2 p109-113 1971, by Francis T. Russell.

Descriptors: (*Axial-flow compressor blades, Efficiency), Fluid dynamic properties, Flow fields, Statistical distributions, Classification, Mathematical models, Experimental data, USSR.
Identifiers: *Compressor blade losses, Total head losses, Secondary losses, Translations.

On the basis of experimental data, relationships are obtained which make it possible to calculate the losses at each cross section with respect to the height of an axial compressor blade. The obtained results permit a judgment to be made concerning the influence of various cascade parameters upon the distribution of losses with respect to blade height. (Author)

N72-27994 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FORTRAN PROGRAM FOR CALCULATING TOTAL EFFICIENCY - SPECIFIC SPEED CHARACTERISTICS OF CENTRIFUGAL COMPRESSORS.
M. R. Galvas. Jul 72, 45p NASA-TM-X-2594, E-6884
Subm- Prepared in Cooperation With Army Air Mobility R and D Lab., Cleveland, Ohio

Descriptors: *Centrifugal compressors, *Computer programs, *Performance prediction, Enthalpy, Fortran, Inlet flow, Tip speed, Velocity measurement.

For abstract, see STAR 10 19.

N72-28790 PC$3.00/MF$0.95
Office National Detudes Et de Recherches Aerospatiales, Paris (France).
UNSTEADY FORCES ACTING ON TURBOMACHINE BLADES.
R. Legendre. 1972, 19p ONERA-TP-1101
Contract PROJ. SQUID
Conf- Presented To the Working Group on Aeroelasticity in Turbomachinery, Indianapolis, 1-2 Jun. 1972 Sponsored By Proj. Squid

Descriptors: *Incompressible flow, *Turbomachine blades, *Two dimensional flow, *Vibration, Integral equations, Unsteady flow.

For abstract, see STAR 10 19.

N72-29993 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ANALYTICAL STUDY OF EFFECT OF CASING TREATMENT ON PERFORMANCE OF A MULTISTAGE COMPRESSOR.
R. W. Snyder, and R. J. Blade. Aug 72, 26p
NASA-TN-D-6917, E-6920

Descriptors: *Compressors, *Pressure distribution, Boundary layers, Simulation.

For abstract, see STAR 10 21.

13H. Industrial Processes

AD-742 058 PC$35.00
Machinability Data Center, Cincinnati, Ohio.
MACHINING DATA HANDBOOK. SECOND EDITION.
1972, 1000p*
Contracts DAAF01-70-C-0062, F33615-71-C-1112
Library of Congress catalog card no. 66-60051. Supersedes AD-636 106.

Descriptors: (*Machining, *Handbooks), Machinability, Cutting tools, Cutting fluids, Surface properties, Drilling, Grinding, Economics, Machine tools, Automation, Standards, Vibration, Data.
Identifiers: *Numerical control.

Contents:
- Machining recommendations;
- Tool geometry;
- Cutting fluids;
- Tool materials;
- Surface finish and surface integrity;
- Guidelines for drilling;
- Machinability;
- Grinding and abrasive machining;
- Economics in machining;
- Vibrations, chatter, and machine tool dynamics;
- Numerical control and adaptive control;
- Machining standards;
- Supplemental machining information;
- Supplemental metallurgical information.

AD-750 399 PC$3.00/MF$0.95
Battelle Columbus Labs Ohio
EFFECTS OF SURFACE-CHEMICAL REACTIONS DURING WET MILLING OF ALUMINA.
Technical rept.,
Russell B. Bennett, and Dale E. Niesz. Oct 72, 32p
Rept no. TR-3
Contract N00014-68-C-0342
Presented at Annual Meeting of The American Ceramic Society (74th), Washington, D. C., 9 May 72.

Descriptors: (*Grinding, *Alumina), Powders, Compacting, Sintering.

Wet ball milling was studied as a method of reducing highly aggregated alumina powders to an ultimate particle condition. The particulate structures in powders milled by various methods were deter-

mined by electron microscope examination and correlated with changes in compaction behavior, sinterability and microstructural uniformity of sintered compacts. Denser aggregates were formed in the wet-milled aluminas. These powders showed improved compactionbehavior but sinterability was reduced. Various experimental methods were used to wash the wet-milled powders. Optimum treatments yielded powders containing no dense aggregates and which showed improved processing behavior. (Author)

AD-750 413 PC$3.75/MF$0.95
California Univ Los Angeles School of Engineering and Applied Science
NEW TECHNIQUES FOR THE SYNTHESIS OF METALS AND ALLOYS.
Semi-annual technical rept. no. 4,
R. F. Bunshah. Sep 72, 45p* Rept no. UCLA-ENG-7288
Grant DAHC15-70-G-15, ARPA Order-1643

Descriptors: (*Vapor plating, Vacuum apparatus), (*Carbides, *Deposition), Titanium compounds, Zirconium compounds, Hafnium compounds, Nickel, Nickel alloys, Chromium alloys, Ceramic coatings, Monitors.
Identifiers: *Activated reactive evaporation, Titanium carbides, *Chemical vapor deposition.

The main tasks are the preparation and testing of the various alloys, ceramics and dispersion strengthened alloys. A new process for the synthesis and high rate deposition of compounds was developed. The process is called Activated Reactive Evaporation. During the reporting period, further work was done relating the synthesis, stoichiometry and microstructure (internal and external) for TiC, ZrC and (Hf-3Zr)C. In addition, considerable development work was done on two important experimental equipment items, i.e., the Laser Pool Height Monitor and the Pressure Barrier.

AD-750 508 PC$3.25/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
PLASTIC DEFORMATION OF REFRACTORY METALS IN A VACUUM,
Ya. B. Gurevich, and V. L. Orzhekhovskii. 8 Sep 72, 23p Rept no. FTD-HT-23-583-72
Edited trans. of Problemy Metallovedeniya i Fiziki Metallov (USSR) n58 p198-211 1968, by Francis T. Russell.

Descriptors: (*Rolling (Metallurgy), *Refractory metals), (*Titanium, Rolling (Metallurgy)), Vacuum, Controlled atmospheres, Deformation, Molybdenum, Tungsten, Niobium, Friction, USSR.
Identifiers: Translations, Plastic deformation.

The high temperature plastic deformation of refractory metals in vacuum (0.0001-0.00001 torr) differ from deformation in air in (1) an absence of scale on the surface of the billets (very fine somewhat oxidized layer is formed only on Ti and Nb), (2) an increase for Nb, Mo, and evidently W, and a decrease for Ti of the friction coefficient during rolling, and (3) an increase in the deformation resistance for Mo and W and a decrease tor Ti and Nb during rolling. (Author)

AD-750 511 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
EFFECTS OF ROLLING CONDITIONS ON THE STRENGTH OF THE BOND BETWEEN NIOBIUM AND COPPER,
A. A. Aleksandrov, N. D. Rybalchenko, and A. S. Tron. 16 Aug 72, 12p Rept no. FTD-HT-23-1058-72
Edited trans. of Politekhnicheskii Institut, Leningrad. Trudy (USSR) n38 p107-110 1969, by Marilyn Olaechea.

Descriptors: (*Niobium, Cladding), (*Copper, Cladding), (*Cladding, Rolling (Metallurgy)), Mechanical properties, Metallography, USSR.
Identifiers: *Bimetals, Translations.

A series of experiments with bonding niobium to copper or a copper alloy by pack rolling in vacuum was performed in order to establish the optimum temperature and reduction, which would ensure a strong bond between both metals. The niobium copper composites are of interest as structural materials which should have a much higher heat resistance than that of copper and a lower susceptibility to local overheating than that of niobium; and as insert materials for welding titanium to steel since niobium is easily welded to titanium and copper can be easily joined to steel. (Author)

AD-750 516 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
A DETERMINATION OF THE OPTIMAL THICKNESS OF THE LUBRICATING FILM AND THE CLEARANCE IN HYDRODYNAMIC DRAWING,
V. I. Kazachenok, and A. S. Chauzov. 17 Aug 72, 7p Rept no. FTD-HC-23-0838-72
Edited trans. of Issledovanie Protsessov Obraboti Metallov Daveniem. Sbornik (USSR) n3 p26-27 1969.

Descriptors: (*Drawing (Machine processing), *Lubrication), Films, Thickness, Optimization, Viscosity, Tolerances (Mechanics), USSR.
Identifiers: Translations.

Equations for determining the optimum thickness of the lubricant layer and optimum clearance between the blank and die, as functions of lubricant viscosity, drawing rate, and the geometrical dimensions of the drawn items, are presented.

AD-750 556 PC$3.00/MF$0.95
Kentucky Univ Lexington
PROJECT THEMIS. METAL DEFORMATION PROCESSING.
Annual rept. no. 3, 1 Sep 70-31 Aug 71,
Hans Conrad, and Mehmet Doner. Jul 72, 221p
AFML-TR-72-12
Contract F33615-69-C-1027

Descriptors: (*Mechanical working, Deformation), (*Titanium alloys, *Extrusion), (*Aluminum alloys, Extrusion), Microstructure, Friction, Lubrication, Titanium, Stresses, Dynamics, Plasticity.
Identifiers: Themis project, Aluminum alloy 2024, Titanium alloy 6Al 4V, Titanium alloy 6Al 2.5Sn.

Uniaxial tensile tests on titanium indicated that (a) twinning is important in the low temperature deformation kinetics of Ti-50A; (b) the deformation kinetics of Ti-6Al-4V at low temperatures are governed principally by the interstitial solute content. Both single and double maximum type flow patterns were observed for the extrusion of Ti-5Al-2.5Sn. The temperature and stress fields existing during the hot extrusion of Ti-6Al-4V were calculated. (Author)

AD-750 697 PC$3.00/MF$0.95
Defence Research Information Centre Orpington (England)
THE INFLUENCE OF STEAM ON THE DEPTH OF FUSION WITH ELECTRON-BEAM WELDING,
U. P. Adler, and E. L. Mamootov. Oct 72, 10p
Rept nos. DRIC-Trans-2927, DRIC-BR-30296
Trans. of Elektronnaya Obrabotka Materialov (USSR) n3 p15-18 1971, by P. H. Moens.

Descriptors: (*Electron beam welding, Steam), Mathematical models, USSR.
Identifiers: Translations.

The interaction of an electron beam with the cloud of steam above a welding pool influences the power characteristics of the process of electron beam welding, and consequently, the geometric parameters of concentrated fusion. In this work an attempt is made to evaluate this influence.

AD-750 698 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
PROBLEMS OF WELDING DISSIMILAR METALS,
B. E. Paton, D. Rabkin, and V. Ryabov. 25 Jul 72, 12p Rept no. FTD-HC-23-1097-72
Unedited rough draft trans. of Akademiya Nauk URSR, Kiev. Visnyk, v35 n2 p16-21 1971.

Descriptors: (*Welding, Bonding), Pressure welding, Metals, Welds, Copper, Titanium, USSR.
Identifiers: *Dissimilar materials bonding, Translations, Cold welding, Friction welding, Diffusion welding.

The article does not exhaust all aspects of the complex problem of welding dissimilar metals. More effort is needed to bring the welding of dissimilar metals to the level of sophistication employed in welding metals of the same type. In welding the majority of dissimilar metals it is necessary to insure minimum fusion of the surface layers of one of the metals. This requires new power and heating sources, as well as new processes for joining dissimilar metals.

AD-750 702 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE KINEMATICS OF CONTACT FLOW WHEN MACHINING PLASTIC STEELS,
N. V. Talantov, and I. I. Mansurov. 28 Jul 72, 14p
Rept no. FTD-MT-24-2154-71
Edited machine trans. of Sovershenstvovanie Protsessov Rezaniya i Povyshenie Tochnosti Metallore-Zhushenikh Stankov (USSR) n1 p3-11 1968, by Robert Allen Potts.

Descriptors: (*Machining, Kinematics), Steel, Friction, USSR.
Identifiers: Translations.

Kinematics of contact flow were studied by machining of 45 steel by a free right angle cutting. MAGNITUDES OF TRANSLATION VELOCITIES4 SHEAR STRESSES AND HEATING TEMPERATURE ALONG THE TOTAL REGION OF CONTACT FLOW WERE DETERMINED IN THE PRESENCE OF MULTISIDED RELATIONSHIPS BETWEEN PARAMETERS. The total friction work on tool working surfaces was subdivided into the works of external and internal friction, for the purpose of evaluating the influence of material contact flow parameters on wear rate. Displacement lines were plotted and the derivation of the equation of motion for material points is presented. (Author)

AD-750 894 PC$4.50/MF$0.95
Naval Intelligence Support Center Washington D C Translation Services Div
WELDING OF SHIP STRUCTURES (SELECTED TRANSLATIONS),
G. A. Belchuk, K. M. Gatovskii, V. B. Kokh, and V. D. Matskevich. 28 Sep 72, 49p Rept no. NISC-Trans-3339
Trans. of mono. Svarka Sudovykh Konstruktsii, Leningrad, 1972 460p.

Descriptors: (*Ship structural components, *Welding), Pressure welding, Arc welding, Inert gas welding, Ship hulls, Ship plates, Brazing, Metallurgy, Metal joints, Mechanical properties, USSR.
Identifiers: Translations, Welded joints.

Contents:
The essence of welding and the history of its development;

Principal forms of pressure and fusion welding;
Gas-flame and gas-arc treatment of metals;
Resistance welding;
Brazing (soldering) of metals;
Welding arc sources and welding equipment;
Thermal fundamentals of wleding;
Metallurgical processes in welding;
Structural and mechanical properties of weld joints;
Welding technology and specifications for shipbuilding structural steel;
Technological characteristics of welding steels;
Welding characteristics of nonferrous metals;
Requirements on performance of welding operations and welding quality control;
General information on welding stresses and deformation;
Thermomechanical processes in the welding of the simplest elements;
Determination of overall welding strain in beam structures;
Local welding strain;
Deformations caused by welding ship assemblies, sections, and hulls;
Static strength of weld joints and structures;
Strength of weld joints and structures under vibratory, fatigue, and impact loads;
Corrosion resistance of weld joints and structures.

AD-750 955 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
TECHNOLOGICAL CHARACTERISTICS OF AUTOMATIC NICKEL AND COPPER WELDING,
I. F. Kuzmin, and V. P. Dobrynin. 18 Aug 72, 13p Rept no. FTD-HC-23-1103-72
Edited trans. of Politekhnicheskii Institut, Perm. Sbornik Nauchnykh Trudov (USSR) n76 p107-116 1970.

Descriptors: (*Welding, Automatic), (*Copper, Welding), (*Nickel, Welding), Welding fluxes, Mechanical properties, Welds, USSR.
Identifiers: *Dissimilar metal welding, Translations.

A study was made of the influence of the flux composition and the brand of electrode wire upon the formation of seams, the mechanical properties and the electrical resistance of welded joints. The mechanical properties of the welded joints were observed to be the best with the use of fluxes AN-348A and AN-26, independently of the brand of wire. These fluxes in combination with monel wire manifested the best results with respect to such technological properties as seam formation, separability of the slag crust, and burning stability of the arc. (Author)

AD-750 958 PC$3.25/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
EFFECT OF HIGH-PRESSURE SHOCK WAVES ON THE STRUCTURE AND PROPERTIES OF BIMETALS PRODUCED BY DIFFERENT CLADDING METHODS,
Z. M. Gelunova, M. G. Lozinskii, P. O. Pashkov, A. I. Tananov, and V. K. Shashkova. 16 Aug 72, 24p Rept no. FTD-HT-23-525-72
Edited trans. of Fizika i Khimiya Obrabotki Materialov (USSR) n3 p110-120 1970, by M. Olaechea.

Descriptors: (*Cladding, Shock waves), Hardening, Stainless steel, Explosive forming, Heat treatment, Mechanical properties, Embrittlement, USSR.
Identifiers: *Bimetals, Translations.

The possibility was established of strengthening the clad metals steel 3 + Kh18N10T and 30KhGSA + Kh18N10T by shock waves. These clad metals are characterized by chemical structural, and mechanical inhomogeneities in the contact zone between the base and cladding materials. The action of shock waves of a large enough amplitude results in a more homogeneous plastic deformation and a lower propensity towards local embrittlement. Treatment of the 2 layer steels by shock waves of 200-300 kilobars with subsequent heat treatment at 600-800 degrees increase the strength, plasticity and reliability of clad materials. (Author)

PAT-APPL-266928 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD OF HEAT TREATING A FORMED POWDER PRODUCT MATERIAL.
Patent Application
J. C. Freche, W. J. Waters, and R. L. Ashbrook.
Filed 28 Jun 72, 11p NASA-CASE-LEW-10805-3
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Forming techniques, *Heat resistant alloys, *Heat treatment, *Metal powder, Isostatic pressure, Metal working, Patent applications, Product development, Production engineering.

Heat treating a product material of prealloyed powders after shaping by superplastic deformation restores the ability of the material to resist deformation at high treating is accomplished by heating to a the solidus and liquidus with the application of isostatic pressure to close any voids. This pressure may be simultaneously applied while the material is at the heat treating temperature. The pressure may also be applied when the material cools to a temperature between that at which it is shaped and the solidus.

N72-29562 PC-GPO/MF$0.95
Battelle Memorial Inst., Columbus, Ohio.
THERMAL AND MECHANICAL TREATMENTS FOR NICKEL AND SOME NICKEL-BASE ALLOYS EFFECTS ON MECHANICAL PROPERTIES.
A. M. Hall, and V. F. Beuhring. 1972, 110p
NASA-SP-5106, LC-75-177269
Subm- Sponsored By Nasa
Paper copy available from GPO $1.00.

Descriptors: *Heat treatment, *Mechanical properties, *Metal working, *Nickel, *Nickel alloys, Aging (materials), Annealing, Cold working, Hardening (materials), Hot working, Stress relieving.

For abstract, see STAR 10 20.

N72-30466 PC-GPO/MF$0.95-NTIS
Battelle Memorial Inst., Columbus, Ohio.
WELDING AND BRAZING OF NICKEL AND NICKEL-BASE ALLOYS.
J. E. Mortland, R. M. Evans, and R. E. Monroe. 1972, 89p NASA-SP-5101, LC-78-177267
Contract NASW-1842
Paper copy available from GPO $1.00.

Descriptors: *Bonding, *Brazing, *Fusion welding, *Nickel alloys, Technology utilization, Weld strength, Welded joints.

For abstract, see STAR 10 21.

N72-30918 PC$3.00/MF$0.95
Cornell Univ., Ithaca, N.Y.
A METHOD OF LIMIT POINT CALCULATION IN FINITE ELEMENT STRUCTURAL ANALYSIS.
R. H. Gallagher, and S. T. Mau. Sep 72, 30p
NASA-CR-2115
Contract NGL-33-010-070

Descriptors: *Finite element method, *Limits (mathematics), *Structural analysis, Algorithms, Buckling, Coordinates, Loads (forces).

For abstract, see STAR 10 21.

13I. Machinery and Tools

AD-750 528 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
CUTTER WEAR IN MACHINING OF METAL-LOCERAMIC MATERIALS,
V. I. Ustimenko. 31 Aug 72, 9p Rept no. FTD-HT-23-868-72
Edited trans. of Issledovaniya v Oblasti Poroshkovii i Struzhkovoi Metallurgii (USSR) n221 p141-143 1969, by Francis T. Russell.

Descriptors: (*Cutting tools, Wear resistance), (*Carbide tools, Wear resistance), Tool steel, Machining, Cermets, USSR.
Identifiers: Translations.

The report gives results of a study of the workability of metalloceramic ferrographite material containing the following in percent: C = 0.88; Si = 0.12; Mn = 0.33; and, U8A steel with similar content and structure.

AD-750 895 MF$0.95
Naval Intelligence Support Center Washington D C Translation Services Div
STUDY OF THE POWER CHARACTERISTICS OF ROLLING BULB-STRIP SHAPES FROM VARIOUS GRADES OF STEEL (ISSLEDOVANIE ENERGETICHESKIKH POKAZATELEI PROKATKI POLOSOBULBOVYKH PROFILEI IZ VAZLICHNYKH MAROK STALI),
D. I. Starchenko, A. M. Savchenko, and F. F. Vlasov. 28 Sep 72, 12p Rept no. NISC-Trans-3342
Trans. of Metallurgicheskii Institut, Zhdanov. Sbornik Nauchnykh Trudov (USSR) n13 p100-110 1971.
Availability: Available in microfiche only.

Descriptors: (*Rolling mills, Performance (Engineering)), (*Ship plates, *Rolling (Metallurgy)), Material forming, Power supplies, Reliability (Electronics), Production control, Precision finishing, Loading (Mechanics), USSR.
Identifiers: Bulb strip steels, Translations.

The report describes experiments performed to ascertain acceptable speeds and feeds, for ship plate rolling, that would not overload the electric drives of the rolling mills.

AD-750 921 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
REINFORCEMENT OF CAPRONIC BEARINGS IN BEARING SHELLS,
A. Skurvydas, and A. Talalas. 1 Sep 72, 10p Rept no. FTD-HC-23-1241-72
Edited trans. of Melioratsiya i Mekhanizatsiya Proizvodstva Selskogo Khozyaistva. Nauchnye Trudy (USSR) v16 n3 p31-35 1969.

Descriptors: (*Roller bearings, *Nylon coatings), Bonding, Surface roughness, Adhesion, Bonded joints, Mechanical properties, USSR.
Identifiers: Translations.

Kapron plain bearings in bearing shells secured with 0.05-0.15 mm epoxy glue had 3 times greater bond strength than the pressure fitted bearings. Roughening the kapron surface increased the bond strength. (Author)

AD-750 952 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
INVESTIGATION OF THE WEAR OF CUTTING TOOLS WHEN MACHINING CAST IRON THROUGH THE CASTING SKIN,
G. A. Chernenko. 28 Jul 72, 11p Rept no. FTD-MT-24-2153-71

Edited machine trans. of Sovershenstvovanie Protsessov Rezaniya i Povyshenie Tochnosti Metallore-Zhushenikh Stankov (USSR) n2 p46-50 1968, by Robert Allen Potts.

Descriptors: (*Cutting tools, Wear resistance), (*Iron alloys, *Machining), Castings, Defects (Materials), Microstructure, Carbide tools, Material removal, Machine shop practice, USSR.
Identifiers: Translations, Iron alloy SCh21 40.

Comparative studies were conducted on the process of turning the SCh21 40 gray cast iron billets over the casting scale and without it, by cutting tools with mechanically fastened VK8 hard alloy inserts. The cutting temperature was measured by the method of natural thermocouple. It was established that the rate of cutting tool wear with respect to time is substantially higher in machining over the scale; the cutting temperature in machining over the scale is higher, while the tool durability (T) is lower. (Author)

AD-750 957 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
HYDROSTATIC BEARING,
L. V. Goryunov. 12 Sep 72, 6p Rept no. FTD-HT-23-726-72
Edited trans. of Patent (USSR) 265 620 p1-2 1970, by Rene E. Courville.

Descriptors: (*Gas bearings, Design), Fluid flow, Configuration, Patents, USSR.
Identifiers: Translations.

The hydrostatic bearing is made in the form of a bushing with chambers and throttling elements serving to feed fluid into chambers under pressure. For the purpose of raising the efficiency and the operating stability of the bearing, in each chamber of the bearing there is a grid installed in which the partitions along the axis of the bearing are parallel to the direction of the shaft. To simplify manufacturing, the windows of the grids are rectangular and are placed in rows.

AD-750 996 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE PROBLEM OF TOOL DIFFUSION WEAR,
N. V. Talantov, and A. I. Konshin. 28 Jul 72, 12p Rept no. FTD-MT-24-2151-71
Edited machine trans. of Soveshenstvovanie Protsessov Rezaniya i Povyshenie Tochnosti Metallorezhushchikh Stankov (USSR) n2 p12-18 1968, by W. W. Kennedy.

Descriptors: (*Carbide tools, Wear resistance), Machine shop practice, Material removal, Machine tools, Adhesion, Friction, Cutting tools, USSR.
Identifiers: Translations, Diffusion wear.

The results of experiments on machining of the 45, 35 KhGSa and EI654 steels by VK8 hard alloy tool showed that on the tool front surface, there are qualitatively different sections of friction surface interactions. On the first section, adjacent to the cutting edge, there is no transfer of chip material along the front tool surface while a plastic run of near contact chip layers is observed. On the second section, the wear is related to the presence of external metal mass transfers over the tool surface and cannot be explained only by diffusion alone. A diffusion wear occurs in the absence of external metal mass transfers in the zone of attachment. (Author)

JPRS-57257 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
DYNAMIC FRICTIONAL MOMENT OF THE BALL BEARING OF A PENDULUM SUSPENSION,
A. D. Egorov. 16 Oct 72, 8p
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Priborostroenie (USSR) n7 p94-97 1972.

Descriptors: (*Ball bearings, Friction factor), Torque, Measurement, Pendulums, USSR, Translations.
Identifiers: Dynamic friction torque.

Expressions are presented for determination of the dynamic friction torque of a ball bearing and the arm of rolling friction at points of contact of the bearing with the inner and outer circles. The use of the expressions produced for determination of friction in the ball bearing of a pendulum support is illustrated.

N72-28499 PC$3.00/MF$0.95
Virginia Univ., Charlottesville.
EFFECT OF SUPPORT FLEXIBILTY AND DAMPING ON THE DYNAMIC RESPONSE OF A SINGLE MASS FLEXIBLE ROTOR IN ELASTIC BEARINGS.
R. G. Kirk, and E. J. Gunter. Jul 72, 60p
NASA-CR-2083, ME-4040-105-71U
Contract NGR-47-005-050

Descriptors: *Bearings, *Dynamic response, *Motion stability, *Rotors, *Supports, Equations of motion, Optimization, Systems engineering.

For abstract, see STAR 10 19.

N72-28504 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DESIGN ANALYSIS FOR A NUTATING PLATE DRIVE 4.
S. H. Loewenthal, and D. P. Townsend. 1972, 13p
NASA-TM-X-68117, E-7050
Conf- Prosposed for Presentation At Mech. Conf. and Intern. Symp. on Gearing and Transmissions, San Francisco, 8-12 Oct. 1972 Sponsored By Asme and Am. Gear Mfr. Assoc.

Descriptors: *Helicopters, *Mechanical drives, *Nutation dampers, *Rotary wings, *Systems analysis, Performance tests, Roller bearings, System effectiveness.

For abstract, see STAR 10 19.

PAT-APPL-266913 PC$3.00/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SCANNING NOZZLE PLATING SYSTEM.
Patent Application
G. D. Oliver. Filed 28 Jun 72, 17p
NASA-CASE-NPO-11758-1
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Etching, *Metals, *Nozzle design, *Plating, *Substrates, High pressure, Patent applications.

A plating system is described where a substrate to be plated is supported on a stationary platform. A nozzle assembly with a small nozzle is supplied with a plating solution under high pressure, so that a constant-flow stream of solution is directed to the substrate. The nozzle assembly is moved relative to the substrate at a selected rate and movement pattern. A potential difference (voltage) is provided between the substrate and the solution in the assembly. The voltage amplitude is modulated so that only when the amplitude is above a minimum known value plating takes place.

N72-28508 PC$3.25/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
PROBLEMS IN THE CONSTRUCTION OF WOODWORKING MACHINES.
W. Schmutzler. Jul 72, 24p NASA-TT-F-14398
Contract NASW-2035
Tran- Transl. Into English From Holz Roh. Werkstoff (Berlin), V. 26, No. 7, Jul. 1968 P 237-243

Descriptors: *Machine tools, *Roller bearings, *Shafts (machine elements), *Wood, Loads (forces), Lubrication, Noise reduction, Spindles.

For abstract, see STAR 10 19.

N72-28509 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
NOISE ABATEMENT IN WOOD WORKING.
W. Schmutzler. Jul 72, 16p NASA-TT-F-14399
Contract NASW-2035
Tran- Transl. Into English From Hole Roh-Werkst. (West Germany), V. 25, No. 4, Apr. 1967 P 130-134

Descriptors: *Machine tools, *Noise reduction, *Systems engineering, *Wood, Machinery, Manufacturing, Noise propagation.

For abstract, see STAR 10 19.

N72-30424 PC$4.50/MF$0.95
Massachusetts Inst. of Tech., Cambridge.
DESIGN AND CONTROL OF REMOTE MANIPULATORS.
Quarterly Report, 5 Apr. - 4 Jul. 1972
D. E. Whitney. 4 Jul 72, 48p NASA-CR-123795, QR-2
Contract NAS8-28055

Descriptors: *Control equipment, *Manipulators, *Remote control, *Systems engineering, Flexibility, Joints (junctions), Simulation, Vibration.

For abstract, see STAR 10 21.

N72-30432 PC$7.25/MF$0.95
General Electric Co., Binghamton, N.Y. Aircraft Equipment Div.
HIGH TORQUE CMG ROTARY ACTUATOR.
Final Report
Jun 72, 103p NASA-CR-122458, ACS-10357
Contract NAS5-20298

Descriptors: *Actuators, *Direct current, *Structural design, *Torque motors, Electromagnets, Performance tests, Rare earth elements, Roller bearings.

For abstract, see STAR 10 21.

13J. Marine Engineering

AD-750 736 PC$3.00/MF$0.95
Northrop Corp Silver Spring Md Electro-Mechanical Div
DEEP SUBMERGENCE SYSTEMS TERMINOLOGY AND USAGE.
30 Jun 70, 77p DSSP-TD-19-Rev-B
Contract N00024-70-C-0201

Descriptors: (*Marine engineering, *Dictionaries), (*Deep submergence, Marine engineering), Instruction manuals, Underwater equipment, Naval operations, Naval equipment, Oceanographic equipment, Salvage, Sea rescues.

The report presents terminology and usage peculiar to the Deep Submergence Systems project. The document is intended to serve as a reference and guide for government and contractor organizations engaged in the preparation of manuals, technical documents, drawings, and other material for DSSP. (Author)

AD-750 852 PC$4.00/MF$0.95
Naval Intelligence Support Center Washington D C Translation Services Div
SUDOSTROENIE. NUMBER 10, 1971 (SELECTED TRANSLATIONS).
28 Sep 72, 38p Rept no. NISC-Trans-3330

Trans. of Sudostroenie (USSR) n10 p37-45, 46-51 1971.

Descriptors: (*Marine engineering, USSR), Automation, Marine surface propulsion, Ship auxiliary equipment, Remote control systems, Optimization, Induction motors, Mathematical models, Production control, Programming (Computers).
Identifiers: Translations, Feedback control.

Contents:
Characteristics of the composite automation of shipboard machinery;
Optimization of a ship control system;
Mathematical modeling of the capacitive self-excitation mode for induction motors;
Problems of general software for production control systems;
Evaluating the level of organization of production in shops of a shipbuilding yard.

COM-72-11372 PC$6.75/MF$0.95
Soros Associates, Inc., New York.
OFFSHORE TERMINAL SYSTEM CONCEPTS. PART 1. EVALUATION OF REQUIREMENTS AND CAPABILITIES FOR DETERMINATION OF THE NEED FOR OFFSHORE TERMINALS.
Final rept.
Sep 72, 249p* MA-RD-900-73002
Contract MA-1-35409
See also report dated Sep 72, COM-72-11156.

Descriptors: (*Marine terminals, *Offshore structures), Supply afloat, Petroleum transportation, Bulk cargo, Commodity management, Market research, Benefit cost analysis, Site surveys, Seaports, Environmental surveys, Merchant ships, Dredging, Design criteria.
Identifiers: *Deepwater terminals, *Offshore terminals, Environmental protection.

The report is Part 1, of a 3 part report covering analysis of U.S. bulk commodity imports and exports, with determination of those for which deepwater transshipment terminals would appear to be justified, analysis of ocean transportation costs and trends in ship size, analysis of characteristics of bulk cargo ports on Atlantic, Gulf and Pacific Coasts, and discussion of need for additional deepwater terminal facilities. (Author)

COM-72-11373 PC$9.00/MF$0.95
Soros Associates, Inc., New York.
OFFSHORE TERMINAL SYSTEM CONCEPTS. PART 2. CONNECTIONS BETWEEN DEEP--DRAFT TERMINALS AND EXISTING FACILITIES BY UTILIZATION OF FEEDER VESSELS, PIPELINES AND/OR SHORE FACILITIES RELOCATION.
Final rept.
Sep 72, 326p MA-RD-900-73003
Contract MA-1-35409
See also Part 1, COM-72-11372, and Part 3, COM-72-11374.

Descriptors: (*Marine terminals, *Offshore structures), Supply afloat, Petroleum transportation, Pipeline transportation, Bulk cargo, Commodity management, Market research, Benefit cost analysis, Site surveys, Seaports, Relocation, Environmental surveys.
Identifiers: *Deepwater terminals, *Offshore terminals, Environmental protection.

The report is Part 2, of a 3 part report which describes significant aspects of shoreline, seabottom, weather, and wave conditions at 17 regions and 33 sites, on all three U.S. coasts, and identifies what are considered to be the most suitable locations in each, discusses environmental and operational considerations for offshore terminals, identifies capital cost and total transportation unit costs for feeder vessel and pipe line systems; and provides data from which the total cost per ton of shipping oil from Persian Gulf to U.S. refineries and markets can be calculated for alternative transshipment terminal locations. The appendix discusses related subjects such as feeder systems, tanker designs, accident prevention. (Author)

COM-72-11374 PC$6.75/MF$0.95
Soros Associates, Inc., New York.
OFFSHORE TERMINAL SYSTEM CONCEPTS. PART 3. FORMULATION OF ADVANCED CONCEPTS FOR OFFSHORE TERMINALS.
Final rept.
Sep 72, 243p MA-RD-900-73002
Contract MA-1-35409
See also Part 2, COM-72-11373.

Descriptors: (*Marine terminals, *Offshore structures), Supply afloat, Petroleum transportation, Pipeline transportation, Environmental surveys, Bulk cargo, Commodity management, Benefit cost analysis, Site surveys, Seaports, Design criteria.
Identifiers: *Deepwater terminals, *Offshore terminals, Environmental protection.

The report is part 3 of a 3 part report, wherein site selection costs, environmental impact, design criteria and economic justification are weighed.

PB-212 457 PC$3.00/MF$0.95
California Univ., Berkeley. Dept. of Naval Architecture.
CAPSIZING EXPERIMENTS WITH A MODEL OF A FAST CARGO LINER IN SAN FRANCISCO BAY.
Final rept. Aug 70-Dec 71,
M.R. Haddara, S. Kastner, J. R. Paulling, L. F. Magel, and L. Perez y Perez. Jan 72, 298p
Contract DOT-CG-84549-A

Descriptors: (*Cargo ships, Stability), Ship models, Ship maneuvering, Ocean waves, Lateral stability, Longitudinal stability, Model tests, Data processing.
Identifiers: American Challenger class vessels, Ship capsizing, Computer aided analysis.

A program of model testing in the open waters of San Francisco Bay is described in the report. This program has, as its objective, the study of ship motion problems including capsizing and control performance in a heavy seaway. The equipment, testing techniques, and data acquisition and processing are described. Some preliminary results from simple statistical analyses of the data are also given. Observations of the behavior of a model of the AMERICAN CHALLENGER class of cargo ships have enabled three categories of capsizing to be distinguished: low cycle resonance, pure loss of stability, and broaching. All three modes are strongly influenced by the reduction of the ship's stability when a wave crest is amidships, and all are most likely to occur in a following to quartering seaway. (Author)

PB-212 700 PC$3.00/MF$0.95
Mitsubishi Heavy Industries, Ltd., Tokyo (Japan).
SHIP HULL ANTI-FOULING SYSTEM UTILIZING ELECTROLYZED SEA WATER.
Mitsubishi technical bulletin,
Jitsu Shibata, Mitshuiko Kimura, Kenji Ueda, and Yajuro Seika. Sep 72, 9p MTB-80

Descriptors: (*Ship hulls, *Fouling prevention), (*Electrolysis, Fouling prevention), Sea water, Design, Bubbles, Chlorine, Economic analysis, Tests, Tanker ships, Japan.

Mitsubishi Heavy Industries, Ltd., has recently developed a new anti-fouling system for protection of ships' hulls. In this system, electrolyzed sea water is mixed with air and released from nozzle pipes which are fitted to the bilge parts of a ship's hull, so that the mixture of electrolyzed sea water and air rises up to the water surface along the ship's side shells. A test unit with a capacity large enough to cover a 100 m long ship's shell plate was built and operated continuously for five months producing and issuing the electrolized sea water over a 4 m x 10 m steel plate immersed in sea water for confirmation of its efficiency and durability. On the basis of the above test results and the preliminary designs of the system worked out for several different ship applications, it is confidently believed that the system offers a great benefit to shipowners. (Author)

13K. Pumps, Filters, Pipes, Fittings, Tubing, and Valves

AD-750 954 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
DIRECT-FLOW GATE VALVE,
R. A. Ramazanov, and R. M. Kuliev. 18 Aug 72, 6p
Rept no. FTD-HT-23-470-72
Edited trans. of Patent (USSR) 270 417 2p 1970, by Rene E. Courville.

Descriptors: (*Gate valves, Design), Patents, Configuration, Structural parts, Performance (Engineering), USSR.
Identifiers: Translations.

The lock is in the form of a fixed conical plug formed from two hollow sections, between which is the locking device. This improves durability. In the body is a locking unit in the form of a conical plug composed of two halves 2 and 3, between which slides the locking device composed of two plates 4 and 5. The halves are kept apart by a screw in the bottom of the body and the plates by springs. The locking device is connected with the spindle. The cock has a piston lubricating system. (Author)

N72-27997 PC$3.00/MF$0.95
Dynatech Corp., Cambridge, Mass.
ANALYSIS AND TESTING OF HIGH ENTRAINMENT SINGLE NOZZLE JET PUMPS WITH VARIABLE MIXING TUBES.
K. E. Hickman, P. G. Hill, and G. B. Gilbert. Jun 72, 141p NASA-CR-2067
Contract NAS2-5845

Descriptors: *Jet pumps, *Nozzle flow, *Nozzle geometry, *Performance prediction, Computer programs, Numerical analysis, Pressure measurements, Test equipment.

For abstract, see STAR 10 19.

N72-29807 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
EXPERIMENTAL FINDINGS FROM ZERO--TANK NET POSITIVE SUCTION HEAD OPERATION OF THE J-2 HYDROGEN PUMP.
H. P. Stinson, and R. J. Strickland. Aug 72, 36p
NASA-TN-D-6824, M-368

Descriptors: *Liquid hydrogen, *Performance tests, *Turbine pumps, Equipment specifications, J-2 engine, Saturn s-4b stage.

For abstract, see STAR 10 20.

N72-30394 PC$3.50/MF$0.95
Wintec Corp., Los Angeles, Calif.
ETCHED TITANIUM DISC FILTER (10 MICRON, 20MICRON).
Feb 72, 29p NASA-CR-127858, TR-258
Contracts NAS7-100, JPL-562636
Subm- Prepared for Jpl

Descriptors: *Fluid filters, *Fluid flow, *Performance, Compression loads, Fluidics, Titanium.

For abstract, see STAR 10 21.

N72-30395 PC$3.00/MF$0.95
Wintec Corp., Los Angeles, Calif.
JPL P/N 71 X 12400 ETCHED DISC FILTER.
1972, 4p NASA-CR-127916, TR-262
Contract NAS7-100
Subm- Prepared for Jpl

Descriptors: *Fluid filters, *Performance tests, Beads, Glass, Separators.

For abstract, see STAR 10 21.

N72-30425 PC$4.00/MF$0.95
Carleton Controls Corp., East Aurora, N.Y.
SOLENOID VALVE, TYPE 1, NASA P/N 20M32258-1 (CARLETON P/N 2426-0001-1).
Summary Report
M. L. Baczkowski. Jun 72, 40p NASA-CR-123790, CR-150
Contract NAS8-26348

Descriptors: *Electric equipment, *Skylab program, *Solenoid valves, *Test equipment, Bioinstrumentation, Performance tests, Product development.

For abstract, see STAR 10 21.

N72-30426 PC$5.00/MF$0.95
Mcdonnell-douglas Astronautics Co., Huntington Beach, Calif.
CONTAMINATION AVOIDANCE DEVICES FOR POPPET TYPE SHUTOFF VALVES.
Quarterly Report, 1 Mar. - 30 May 1972
D. L. Endicott. 15 Jun 72, 56p MDC-G3118, NASA-CR-127346
Contract NAS3-14375

Descriptors: *Control valves, *Performance tests, *Pneumatic equipment, *Quality control, Environmental tests, Product development, Reliability engineering.

For abstract, see STAR 10 21.

13L. Safety Engineering

N72-28510 PC$3.25/MF$0.95
National Research Council of Canada, Ottawa (Ontario).
MEASUREMENT OF RADIANT POWER AT WELDING PROCESSES AND CONSEQUENCES FOR EYE PROTECTION AGAINST IR RADIATION..
H. Huebner, E. Sutter, and K. Wicke. 1972, 23p NRC-TT-1563
Tran- Transl. Into English From Optik (Stuttgart), V. 31, No. 5, 1970 P 462-476

Descriptors: *Cataracts, *Eye protection, *Radiant flux density, *Welding, Equipment specifications, Eye diseases, Infrared filters, Radiative heat transfer, Safety devices.

For abstract, see STAR 10 19.

N72-28566 PC-GPO/MF$0.95-NTIS
General Electric Co., Houston, Tex.
SYSTEMATIC CONTROL OF NONMETALLIC MATERIALS FOR IMPROVED FIRE SAFETY.
1972, 38p NASA-SP-5109
Subm- Sponsored By Nasa. Paper copy available from GPO $0.45.

Descriptors: *Apollo spacecraft, *Fire control, *Materials science, *Safety factors, Criteria, Elastomers, Fire prevention, Flammability, Glass fibers, Spacecraft design.

For abstract, see STAR 10 19.

N72-30496 PC$5.75/MF$0.95
Msc White Sands Test Facility, N.Mex.
FLASH AND FIRE TEST EVALUATION OF THE BEHAVIOR OF NONMETALLIC MATERIALS IN HYDROGEN.
Summary Report
30 Mar 72, 75p NASA-TM-X-68739, TR-196-002
Misc- Original Contains Color Illustrations

Descriptors: *Composite materials, *Flammability, *Hydrogen, *Ignition limits, Combustion temperature, Materials tests, Thermodynamic properties.

For abstract, see STAR 10 21.

PB-212 672 PC$3.00/MF$0.95
National Highway Traffic Safety Administration, Washington, D.C. Office of Accident Investigation and Data Analysis.
SUMMARY OF 1968-1970 MULTIDISCIPLINARY ACCIDENT INVESTIGATION REPORTS. VOLUME 1.
Jun 71, 282p DOT-HS-600 596
See also Volume 2, PB-212 673.

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Death, Injuries, Design standards, Automobile bodies, Automobile engines, Safety belts, Traffic engineering, Highway planning.
Identifiers: *Automobile collisions, Vehicle passenger compartments, Highway hazards.

The volume summarizes 448 multidisciplinary accident investigation reports submitted to the National Highway Traffic Safety Administration during the Fiscal Years 1968-1970. The volume contains a listing of all the causal factors, conclusions and recommendations which emanated from these reports. The factors are listed according to the team who investigated the accidents and the particular case number. The factors are also categorized according to a 9-cell highway safety program matrix which is described in Section I. This volume should be used in conjunction with Volume 2 in the series in order to derive maximum benefit from the accident findings. Volume 2 contains a frequency aggregation of all the findings listed in the volume. (Author)

PB-212 673 PC$3.00/MF$0.95
National Highway Traffic Safety Administration, Washington, D.C. Office of Accident Investigation and Data Analysis.
SUMMARY OF 1968-1970 MULTIDISCIPLINARY ACCIDENT INVESTIGATION REPORTS. VOLUME 2.
Aug 72, 67p DOT-HS-600 861
See also Volume 1, PB-212 672.

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Death, Injuries, Design standards, Automobile bodies, Automobile engines, Safety belts, Traffic engineering, Highway planning.
Identifiers: *Automobile collisions.

In June 1971, Volume 1 of a two-volume series summarizing the causal factors, conclusions and recommendations which emanated from various in-depth accident reports was published. This first volume contained a listing of these factors according to team and case number from 448 Multidisciplinary Accident Investigation Reports submitted to the NHTSA during the years 1968 to 1970. Volume 2 contains aggregations of all the factors listed from the individual reports in Volume 1. These aggregations are listed according to the matrix cell they are categorized under, major topic areas, and the Team and Case Number of occurrence. (Author)

PB-212 678 PC$3.00/MF$0.95
National Academy of Engineering, Washington, D.C. Committee on Transportation.
URBAN TRANSPORTATION RESEARCH AND DEVELOPMENT.
1972, 77p* ISBN-0-309-00017-3

Descriptors: (*Urban transportation, Research), Urban areas, Urban transportation, Demography, Services, Problem solving, Economic analysis, Recommendations, Transportation management, Reviews, Mass transportation.
Identifiers: *Low income groups, Transportation research.

The report presents the findings of a recent study on urban transportation and related urban development. Recognizing that current programs in this area have not had the desired impact on congestion or pollution problems, the report suggests strengthening many research and development programs of the Department of Transportation. The report further suggests that new efforts be initiated by DOT in certain critical areas of the urban transportation overall problem.

PB-212 709 PC$3.00/MF$0.95
Richardson, Bellows, Henry and Co., Inc., Washington, D.C.
MATERIALS FOR USE IN IMPLEMENTING THE WRITTEN SAFETY EXAMINATION REQUIREMENT.
Final rept.
Jul 72, 79p BMCS-RD-71-1b
Contract FH-11-7807

Descriptors: (*Motor vehicle operators, Tests), (*Common carriers, Safety), Regulations, Performance standards, Buses (Vehicles), Motor trucks, Aptitude tests.
Identifiers: Qualifying examinations, Written examinations.

The questions in the booklet are based on the United States Department of Transportation's motor carrier safety regulations. Applicants for the position of commercial driver are required to take the examination and answer seventy percent of its questions correctly before they can be considered qualified to drive. (Author)

13M. Structural Engineering

AD-750 550 PC$3.00/MF$0.95
Massachusetts Inst of Tech Cambridge Aeroelastic and Structures Research Lab
WIND EXCITED VIBRATION OF SQUARE SECTION BEAM AND SUSPENDED CABLE,
Vivekananda Mukhopadhyay. May 72, 133p Rept no. ASRL-TR-159-3 AFOSR-TR-72-2008
Contract F44620-69-C-0091

Descriptors: (*Cantilever beams, *Vibration), (*Cables (Mechanical), Vibration), Wind, Equations of Motion, Aerodynamic loading.
Identifiers: One degree of freedom, Two degrees of freedom.

The self-excited oscillation of a square section vertical cantilever beam and a square section sagging suspended cable in a uniform wind stream was investigated theoretically and experimentallly. Experimental quasi-static representation of aerodynamic forces was used to determine the responses theoretically. The excitation is due to negative damping type aerodynamic forces and the amplitude is limited as the forces become nonlinear. The governing equations were reduced to ordinary differential equations by Galerkin's method and steady state solutions were determined by harmonic balance technique. (Author)

N72-27996 PC$3.75/MF$0.95
National Physical Lab., Teddington (England). Div. of Maritime Science.
MEASUREMENTS OVER A WIDE RANGE OF REYNOLDS NUMBERS OF THE WIND FORCES ON MODELS OF LATTICE FRAMEWORKS WITH TUBULAR MEMBERS.
R. W. Gould, and W. G. Raymer. May 72, 32p NPL-MAR-SCI-5-72

Descriptors: *Loads (forces), *Structural members, *Towers, *Wind tunnel stability tests, Columns (supports), Frames, Structural design criteria.

For abstract, see STAR 10 19.

N72-29543 PC$3.00/MF$0.95
TRW Systems Group, Redondo Beach, Calif.
PULSED DIFFERENTIAL HOLOGRAPHIC MEASUREMENTS OF VIBRATION MODES OF HIGH TEMPERATURE PANELS.
D. A. Evensen, R. Aprahamian, and K. R. Overoye. Jun 72, 139p NASA-CR-2028, AM-71-7

Contract NAS1-10169

Descriptors: *High temperature, *Holography, *Vibration mode, Imaging techniques, Panel flutter, Space shuttles, Steels, Turbulence.

For abstract, see STAR 10 20.

N72-29094 PC$3.00/MF$0.95
TRW Systems Group, Redondo Beach, Calif.
HOLOGRAPHIC MEASUREMENT OF WAVE PROPAGATION IN AXI-SYMMETRIC SHELLS.
D. A. Evensen, R. Aprahamian, and J. L. Jacoby.
Jun 72, 203p NASA-CR-2063, AM-71-8
Contract NAS1-9876

Descriptors: *Holography, *Interferometry, *Pulsed lasers, *Transverse waves, *Wave propagation, Axisymmetric bodies, Conical shells, Cylindrical shells, Imaging techniques.

For abstract, see STAR 10 20.

N72-30919 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
VIBRATION AND AERODYNAMIC BUCKLING EXPERIMENTS FOR BLUNT TRUNCATED CONICAL SHELLS WITH RING-SUPPORTED EDGES.
R. Miserentino, and S. C. Dixon. Sep 72, 34p
NASA-TN-D-6864, L-8185

Descriptors: *Buckling, *Conical shells, *Reinforcement rings, *Vibration, Aerodynamic loads, Blunt bodies, Cross sections.

For abstract, see STAR 10 21.

PB-212 439 PC$3.00/MF$0.95
Transport and Road Research Lab., Crowthorne (England).
VEHICLE IMPACT TESTS ON A CHRISTIANI AND NIELSEN BRIDGE PARAPET,
V. J. Jehu, and G. R. Taylor. 1972, 18p TRRL-LR-482

Descriptors: (*Highway bridges, *Barriers), (*Safety, Highway bridges), Impact tests, Shock resistance, Design, Automobiles, Great Britain, Buses (Vehicles).
Identifiers: *Bridge parapets.

Impact tests with a car and a passenger coach were carried out on a bridge parapet designed by Messrs. Christiani and Nielsen Limited. The novel feature of the parapet is the design of the posts which pivot about their bases against the resistance of built-in hydraulic shock absorber units. The parapet is intended as an alternative to Group P1 vehicle parapets specified in Ministry of Transport Technical Memorandum (Bridges) No. BE5, which are required to contain a car weighing 1.5Mg striking at 113 km/h and 20 deg; there are no current requirements in respect of heavier vehicles. In these tests the containment and redirection properties of the hydraulic parapet were satisfactory for the car and were better than those of current Group P1 parapets for the heavier vehicle. (Author)

PB-212 440 PC$3.00/MF$0.95
Transport and Road Research Lab., Crowthorne (England).
VEHICLE IMPACT TESTS ON REINFORCED CONCRETE BRIDGE PARAPETS,
V. J. Jehu, and I. B. Laker. 1972, 32p TRRL-LR-485

Descriptors: (*Highway bridges, *Barriers), (*Safety, Highway bridges), Impact tests, Reinforced concrete, Automobiles, Buses (Vehicles), Shock resistance, Great Britain.
Identifiers: *Bridge parapets.

Tests showed that a reinforced concrete bridge parapet similar to that erected on an elevated motorway in West London complied with the requirements of Technical Memorandum No. BE5 in that it contained a vehicle weighing 1530 kg striking at 113 km/h and at 20 deg. In addition the parapet adequately withstood impacts from a passenger coach weighing 5670 kg striking at 80 km/h and 20 deg. The transverse deceleration of private cars was reduced from about 8g to 5g by using energy absorbing systems either in steel or plastics fitted to the traffic face of the parapet. Damage to the cars was reduced and they were steered back to the parapet after impact. The same energy absorbing systems had less effect on the impacts with coaches although the vehicles were noticeably less damaged. (Author)

PB-212 441 PC$3.00/MF$0.95
Transport and Road Research Lab., Crowthorne (England).
VEHICLE IMPACT TESTS ON FRANGIBLE AND YIELDING POST DESIGNS OF BRIDGE PARAPETS,
V. J. Jehu. 1972, 23p TRRL-LR-495

Descriptors: (*Highway bridges, *Barriers), (*Safety, Highway bridges), Design, Impact tests, Containment, Automobiles, Buses (Vehicles), Fracturing, Great Britain.
Identifiers: *Bridge parapets.

Two designs of post and rail bridge parapets were developed which provide more positive containment of vehicles and better vehicle response after impact than conventional parapets. In one design the posts fracture at their bases at a predetermined transverse loading thereby minimising the rolling motion of a large vehicle towards the parapet. In the tests both a car striking at 116 km/h and 20 deg and a coach striking at 82 km/h and 20 deg exhibited the same steer back response towards the parapet after impact. The car weighed 1488 kg and the coach 5194 kg. Maximum wheel penetration of the coach was 0.79 m. In the second design the posts yield, bending at their bases under impact from a large vehicle but are not damaged by car impacts. In the tests a coach striking at 86 km/h and 20 deg was redirected at 13 deg to the parapet with a maximum wheel penetration of 0.36 m. A car striking at 109 km/h and 20 deg was steered back to the parapet after impact. (Author)

PB-212 615 PC$4.50/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Dept. of Civil Engineering.
A COMPREHENSIVE COMPUTER-AIDED BUILDING DESIGN SYSTEM.
Research rept. 1971-72,
David G. Elms. Jun 72, 68p* R72-32, Structures Pub-343
Grant NSF-GK-25510X

Descriptors: (*Residential buildings, Design), Decision making, Design criteria, Design standards, Problem solving, Systems engineering, Computer systems programs, Evaluation.
Identifiers: *Computer aided design, Industrialized housing.

The report considers the building as a system and shows the need for a comprehensive computer-aided building design system. A brief look is taken of the current design process to illustrate the need for a program to consider the entire system rather than for individual programs to consider the subsystems. This design system is to aid the design team, not do the actual design. The goal was to provide a means of faster evaluation of a set of parameters, to allow consideration of more possible alternatives. Hopefully, this will provide better information upon which the different members of the design team can base their decisions. (Author)

PB-212 619 PC$6.00/MF$0.95
Illinois Univ., Urbana. Dept. of Civil Engineering.
TIME-DEPENDENT BEHAVIOR OF NONCOMPOSITE AND COMPOSITE PRESTRESSED CONCRETE STRUCTURES UNDER FIELD AND LABORATORY CONDITIONS.
Civil engineering studies,
V. Mossiossian, and W. L. Gamble. May 72, 538p
Structural Research Ser-385, UILU-ENG-72-2006
Report on Illinois Cooperative Highway Research Program Series-129. Prepared in cooperation with Illinois State Div. of Highways and Federal Highway Administration.

Descriptors: (*Bridges (Structures), *Prestressed concrete), (*Girders, Prestressed concrete), (*Highway bridges, Structural analysis), Beams (Supports), Computer programming, Girder bridges, Creep properties, Shrinkage, Computerized simulation.

Computer analysis methods, based on rate of creep and superpositions methods, for predicting time-dependent deformations in prestressed concrete girders are presented. The effects of arbitrary variations of creep and shrinkage in noncomposite beams, and of differential creep and shrinkage in simply supported and continuous composite girders, can be taken into account. Predicted deformations are compared with measured values obtained over a period of two years on a full-size, three span prestressed I-beam highway bridge, and with values from 1/8th scale models of parts of the same structure. The effects of the size and shape of creep and shrinkage specimens were studied. (Author)

PB-212 770 PC$3.00/MF$0.95
National Swedish Inst. for Building Research, Stockholm.
CRACKS IN CONCRETE WALLS.
Building research,
Ake Holmberg, and Sten Lindgren. 1972, 75p
D7:1972
International Standard book no. 91-540-2027-1.
Also available from: Svensk Byggtjanst, Box 1403, S-111 84. PC. Price: Sw. Kr. 18.

Descriptors: (*Walls, Cracks), (*Concrete construction, Walls), Deformation, Reinforced concrete, Spacing, Rigidity, Modulus of elasticity, Applications of mathematics, Tensile strength, Compressive strength, Tests, Sweden.

An earlier investigation, published by the same authors, has led to fundamental conclusions regarding the distribution and the width of stable cracks in concrete structures. The available data on crack spacings was summarized in a crack formula. The present report, however, rejects this formula and presents a new one which takes into account the full range of experimental material available, including material contained in this report. The new crack formula has a wider range of application, covering as it does walls having different types of reinforcement and also to a certain extent slabs with two-way reinforcement. (Author)

PB-212 772 PC$3.00/MF$0.95
National Swedish Inst. for Building Research, Stockholm.
SHEAR AND TORSION IN REINFORCED CONCRETE BEAMS. A STUDY OF CRITICAL LOAD AND TORSIONAL STIFFNESS.
Building research,
Tage Petersson.1972, 281p D10:1972
International standard book no. 91-540-2049-2.
Also available from: Svensk Byggtjanst, Box 1403, S-111 84. Stockholm, Sweden. PC.Price: Sw. Kr.38.

Descriptors: (*Beams (Supports), Loads (Forces)), (*Reinforced concrete, Beams (Supports)), Torsion, Shear stress, Bending, Strain, Bearing capacity, Compression tests, Failure, Stiffness, Sweden.

The internal forces and the critical loads in reinforced concrete beams with stirrups are studied in

this report. Three different types of loading are examined individually; simultaneous bending and shear; torsion; and, simultaneous torsion, bending and shear. The report defines the critical load as the load which causes the stirrups to yield. The internal forces are illustrated by means of truss models in which the inclination of the compression struts is not known. This is determined by the energy method. Comparisons are made with tests, and these appear to confirm that the assumptions made with regard to the internal forces are reasonable. Comparisons are also made with additive formulae in the Swedish regulations for concrete structures (B7 1968) as regards the above-mentioned loads. (Author)

PB-212 773 PC$3.00/MF$0.95
National Swedish Inst. for Building Research, Stockholm.
FOREIGN LANGUAGE PUBLICATIONS ON BUILDING IN SWEDEN, 1969-1971.
Building research.
1972, 61P D1:1972
International Standard book no. 91-540-2013-1.
Also available from: Svensk Byggtjanst, Box 1403, S-111 84 Stockholm, Sweden. PC. Price Sw.Kr. 13.

Descriptors: (*Construction, *Sweden), (*Bibliographies, Construction), Subject indexing, Classifications, Periodicals, Books, Technical reports, Research.
Identifiers: Foreign language publications, Annotated bibliographies.

The document lists articles published on the subject of building in Sweden in English, French and German in books, research reports, periodicals or publications series between the beginning of 1969 and 1st July, 1971. The expression 'Building in Sweden' is interpreted in its widest sense and covers physical planning, design work, construction and management of buildings, external works and engineering services. The list includes presentations of Swedish building institutions. The material is arranged under 43 subject headings. Bibliographic data plus synopses in both Swedish and the original language are provided on each article. (Author)

PB-212 775 PC$3.00/MF$0.95
National Swedish Inst. for Building Research, Stockholm.
ACCESSIBLE TOWNS. WORKABLE HOMES. PLANNING WITH CONSIDERATION FOR THE HANDICAPPED.
Building research.
1972, 34P D9:1972
International Standard Book no. 91-450-2044-1.
Also available from: Svensk Byggtjanst, Box 1403, S-1184, Stockholm, Sweden. PC. Price: Sw. Kr. 18.

Descriptors: (*Handicapped persons, Buildings), (*Buildings, Safety factor), Design standards, Passageways, Availability, Wheel chairs, Social welfare, Law (Jurisprudence), Doors, Ramps, Standards, Residential buildings, Sweden.

A number of publications, issued by the National Swedish Building Research, have been dealing with the necessity of taking the needs of the handicapped into account when planning buildings and outdoor environments. Two of these will be published jointly in this Document. Both bear in mind that handicap is a combination of physical disability and deficiencies of the environment. Planners must therefore concentrate on providing both indoor and outdoor environments that are accessible to all groups of the population, including the 'handicaped'. (Author)

14. METHODS AND EQUIPMENT

14A. Cost Effectiveness

N72-30982 PC$4.50/MF$0.95
Elliott-automation Space and Advanced Military Systems, Ltd., Camberley (England).
AN INTRODUCTION TO SYSTEM COST MODELLING.
A. T. Boyd. May 72, 50p ETN-6

Descriptors: *Cost analysis, *Cost estimates, *Mathematical models, *Operations research, Assessments, Computerized simulation, Cost effectiveness, Decision making, Economic factors, Military aviation, Project planning, Systems analysis, Value engineering.

For abstract, see STAR 10 21.

14B. Laboratories, Test Facilities, and Test Equipment

AD-750 305 PC$3.00/MF$0.95
Army Materials and Mechanics Research Center Watertown Mass
FAST NEUTRON RADIOGRAPHY,
John J. Antal, and Robert L. Becker. 1972, 10p

Descriptors: (*Radiography, Fast neutrons), Nondestructive testing, Californium, Radioactive isotopes.
Identifiers: *Fast neutron radiography, Californium 252.

The fast neutron radiography system described is in an early state of development, but the results obtained to date suggest that it could become a truly useful nondestructive testing technique. It has the potential for competing with thermal neutron radiography in its ability to image hydrogen-containing materials such as phenolics and plastics, and appears to be of general radiographic use in the same manner as x-radiography while retaining good penetrating ability. The use of californium-252 as a source of neutrons provides radiation emitted in all directions allowing simultaneous exposures to be made over the full surface of a sphere surrounding the source, thereby increasing its efficiency many-fold. (Author)

AD-750 315 PC$3.00/MF$0.95
Army Engineer Topographic Labs Fort Belvoir Va
IMAGE AREA MEASUREMENT USING A SENSOR ARRAY SYSTEM,
Pi-Fuay Chen, and William W. Seemuller. 1972, 11p

Descriptors: (*Meters, Optical images), Sensors, Measurement, Photogrammetry.
Identifiers: Area, *Dimensional measurement, Metrology.

The paper describes an image area measurement system using a square (two-dimensional) sensor array. The discussion of error analysis and computational results are followed by a description of a hardware system and practical measurement results. Some practical applications of the system are suggested. (Author)

AD-750 354 PC$3.00/MF$0.95
Watervliet Arsenal N Y
THE MEASUREMENT AND ANALYSIS OF FATIGUE CRACK GROWTH IN THICK-WALLED CYLINDERS,
James J. Miller, Donald C. Winters, and Robert R. Fujczak. 1972, 14p

Descriptors: (*Probes, Ultrasonic radiation), (*Cracks, Probes), (*Gun barrels, Fatigue (Mechanics)), Cylindrical bodies, Crack propagation, Measurement, Data processing systems, Test methods.
Identifiers: *Ultrasonic tests, ULTRARAX computer program, ULTOCRAK computer program, CRACKERS computer program.

The investigation developed an ultrasonic technique to measure crack depth, a locating device and data acquisition system to automatically record findings, and computer programs to analyze and report test results in a useful graphic format. The paper describes and evaluates these three interdependent developments. (Author)

AD-750 363 PC$3.00/MF$0.95
Army Infantry Board Fort Benning Ga
EXPERIMENT TO ASSESS CAPABILITIES OF AN AUTOMATED SMALL ARMS TEST FACILITY,
Alan B. Phillips, and Robert M. Jones. 1972, 15p

Descriptors: (*Small arms, *Test facilities), Rifles, Army personnel, Performance tests, Test methods, Ranges (Establishments), Firing tests (Ordnance), Instrumentation.

A detailed analytical investigation led to the establishment of 28 measures of effectiveness (MOE) which must be addressed in any rifle test. The same analysis also clearly indicated that no single test bed would suffice. Accordingly, three test facilities were constructed as part of the study. This range was designed to be fully automated to include target control, data collection and storage, and data analysis. This paper is concerned only with field firing performance of Infantry rifles and consists of three sections. Section I, Methodology, summarizes the analytical approach pointing to the requirement for three test facilities. Section 2 discusses the Defense Range, particularly the testing performed to evaluate the capabilities of such a sophisticated facility. Section 3 consists of a conclusion. (Author)

AD-750 392 PC$3.00/MF$0.95
Naval Weapons Lab Dahlgren Va
A HELIUM-NEON LASER HIT-KILL SIMULATOR,
W. Brinton Yorks, Wayne F. Wilson, Eric L. Kratschmer, Jerome C. Isaacson, and William W. Curtis, Jr. 1972, 14p

Descriptors: (*Kill probabilities, *Simulators), (*Weapon systems, *Gas lasers), Aerial gunnery, Air-to-surface, Surface targets, Surface-to-surface, Training devices, Safety, Fire control system components.
Identifiers: Hit Kill simulators.

The report describes the development of a gas laser to be used as an air to ground and a ground to ground target hit/kill indicator. Design constraints and test methods are described.

AD-750 465 PC$3.00/MF$0.95
Wyle Labs Huntsville Ala Eastern Operations
ENVIRONMENTAL IMPACT OF NOISE FROM THE PROPOSED ARNOLD ENGINEERING DEVELOPMENT CENTER (AEDC) HIGH REYNOLDS NUMBER TUNNEL.
Final rept. 13 Mar-30 Jun 72,
K. J. Plotkin, J. E. Robertson, and J. A. Cockburn.
Oct 72, 181p Rept no. WR-72-7 AEDC-TR-72-151
Contract F40600-72-C-0007

Descriptors: (*Noise, Environment), (*Wind tunnels, Noise), Thresholds (Physiology), Measurement, Control, Protection, Humans, Animals, Tolerances (Physiology), Public health.
Identifiers: *Noise pollution.

A study to evaluate the environmental impact of the noise produced by a proposed High Reynolds Number Tunnel (HIRT) under consideration at the

Arnold Engineering Development Center (AEDC) has been conducted by Wyle Laboratories. During earlier studies, the noise characteristics of the HIRT facility were defined. These studies included (1) theoretical analyses of the noise generation mechanisms associated with the operation of the facility, and (2) scale-model experiments to provide base-line data for extrapolation to full-scale conditions. The assessment of environmental impact, based on the predicted noise environment of the full-scale facility, is the subject of this report. This assessment contains all pertinent data of relevance to the noise impact which may be anticipated during HIRT operation and includes (1) a summary of the Noise Characteristics of HIRT, (2) Specification of Acceptable Noise Limits for people, animals, and buildings which will be exposed to HIRT noise, (3) the Environmental Impact of HIRT noise as evaluated by comparing HIRT noise with acceptable limit criteria, and ($) Special Considerations for Noise Protection and Control. (Author)

AD-750 472 PC$3.00/MF$0.95
Innsbruck Univ (Austria) Electronics Lab
A DIGITAL PHASE MEASURING DEVICE.
Report for Jan-Jul 72,
Dieter Fritz. 15 Jul 72, 19p Rept no. Scientific-1 AFCRL-72-0551
Contract F44620-72-C-0052

Descriptors: (*Phase meters, Digital systems), Logic circuits, Extremely low frequency, Very low frequency, Low frequency, Phase measurement, Errors, Austria.

With the device described it is possible to measure the mutual phase position of two signals with special consideration of the propagation of VLF and LF waves. The minimum operating input amplitude is selectable. The phase is indicated digitally and is independent on the amplitude and the frequency between 100 Hz and 100 kHz. The device is intended for battery operation (minimum current consumption). The errors resulting from the principle of measurement are calculated and methods are described to restrict them to a minimum. In addition to the block circuit diagram detailed connection diagrams are given. (Author)

AD-750 489 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
BEAM CORRECTION DEVICE USED IN ELECTRON-OPTICAL INSTRUMENTS,
G. S. Krivosheya, and A. S. Lebedinskii. 25 Aug 72, 8p Rept no. FTD-HT-23-1286-72
Edited trans. of Patent (USSR) 270 098 2p, 1970, by Rene E. Courville.

Descriptors: (*Electron beams, Control systems), (*Electron optics, Instrumentation), Patents, USSR.
Identifiers: Translations.

An instrument for bending a flat beam of electrons was made smaller and is described in the report. The biasing voltages for introducing a correction in the path followed by the electrons are not critical.

AD-750 561 PC$3.00/MF$0.95
Admiralty Oil Lab Cobham (England)
GLASS CAPILLARIES FOR GAS CHROMATOGRAPHY.
Technical memo.,
R. H. Morgan. Apr 70, 6p Rept no. AOL-TM-55 NSTIC-26424

Descriptors: (*Gas chromatography, Capillary tubes), (*Capillary tubes, *Drawing (Machine processing)), Laboratory equipment, Design, Great Britain.

The report briefly discusses the use of a glass capillary drawing machine to prepare columns for a capillary gas chromatograph.

AD-750 589 PC$3.00/MF$0.95
European Research Office London (England)
VISIT TO THE NATIONAL AEROSPACE LABORATORY (NLR), AMSTERDAM, NETHERLANDS, 17 AUGUST 1972.
Trip rept.,
Richard L. Scharpf. Oct 72, 10p Rept no. ERO-12-72

Descriptors: (*Aeronautical laboratories, *Simulators), Netherlands.

NLR was visited for the purpose of reviewing the status of the simulator effort and receiving a briefing on the future simulator facility. (Author)

AD-750 590 PC$3.00/MF$0.95
Army Missile Command Redstone Arsenal Ala Systems Engineering and Integration Office
A LAPLACE TRANSFORM AMPLITUDE FUNCTION GENERATOR UTILIZING A THIN FILM SEMICONDUCTOR.
Technical rept.,
James E. Brown, Jr. 31 Jul 72, 80p Rept no. RC-TR-72-2

Descriptors: (*Test equipment, Semiconductor devices), (*Semiconducting films, Signal generators), (*Integral transforms, Signal generators), Analog-digital computers, Electric fields, Complex variables, Analytic functions, Computer programs.
Identifiers: *Laplace transformation, Thin films, Function generators, Analogs, Analog simulation, Wafers.

The characteristics of many systems can be predetermined by application of an analog. The report was developed to produce a better tool in the area of the electric field analog. It develops as a straightforward proof of the analog existence with the main body being experimental. The experimental area develops in normal form with early familiarization methods through various phases to the final result. The semiconductor can be used with more consistency, and better results, than any present guaranteed device on the market. (Author)

AD-750 595 PC$3.00/MF$0.95
Cold Regions Research and Engineering Lab Hanover N H
ELECTROPHOTOMETER FOR RECORDING THE RATIO OF TWO LIGHT CURRENTS (ELEKTROFOTOMETER DLYA ZAPISI OTNOSHENIYA DVUKH SVETOVYKH NOTOKOV),
G. M. Malyshev. Oct 72, 8p Rept no. CRREL-TL364
Draft trans. of Pribory i Tekhnika Eksperimenta (USSR) v6 p98-100 1957, by M. Corbin.

Descriptors: (*Photometers, Design), (*Potentiometers, Recording systems), Photomultipliers, Automatic, Light, USSR.
Identifiers: *Electrophotometry, Translations.

Described is an experimental model of an electrophotometer recording the ratio of two light currents. The electrophotometer consists of two photomultipliers, a double bridge amplifier and an automatic potentiometer recorder. All basic components of the photometer are described and examples of records are given. (Author)

AD-750 692 PC$3.00/MF$0.95
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept
DEVELOPMENT OF COUNTING STRAIN GAGES FOR HIGH-G NAVAL AIRCRAFT.
Final rept.,
David E. Weiss, and Sidney Scheindlinger. 15 Sep 72, 24p Rept no. NADC-72090-VT

Descriptors: (*Strain gages, Design), (*Naval aircraft, Fatigue (Mechanics)), Flight instruments, Transducers, Sensitivity, Calibration, Sensors, Airframes, Stresses, Flight testing.

The NAVAIRDEVCEN has developed and constructed an airborne Strain Level Counter which presents visually the numbers of times that each of four strain levels has been exceeded. The system has two major components: an inductive strain sensor, installed in the critical structural area, which develops a voltage proportional to the strain: an indicator unit which houses all the solid state circuitry necessary to energize the sensor and condition its output. The output, after appropriate filtering, is displayed on four electro-mechanical counters. Laboratory and flight tests of the strain sensor alone have been completed and are described. Overall accuracy of the complete system over the temperature range of -55C to +125C is estimated to be within 5%. (Author)

AD-750 701 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
MACHINE FOR TESTING MATERIALS FOR WEAR,
V. N. Vinogradov, G. K. Shreiber, G. M. Sorokin, I. I. Matyushina, and L. F. Krutyakova. 22 Sep 72, 8p Rept no. FTD-HT-23-1032-72
Edited trans. of Patent (USSR) 258 682 p1-2 1970, by Rene Courville.

Descriptors: (*Test equipment, Wear resistance), Impact tests, Patents, USSR.
Identifiers: Translations.

The machine for testing materials for wear contains a bed with vertical guides, a spindle (on the end of which the specimen is mounted), that moves through them, a cam mechanism with a drive which transmits motion to the spindle, and a table on which to place the material that interacts with the specimen. (Author)

AD-750 710 PC$3.00/MF$0.95
California Univ Los Angeles School of Engineering and Applied Science
DYNAMIC FRACTURE TOUGHNESS DETERMINED FROM INSTRUMENTED PRE-CRACKED CHARPY TESTS.
Technical rept.,
William Leon Server. Aug 72, 106p Rept no. UCLA-ENG-7267 AROD-8016:7-MC
Contract DAHC04-69-C-0008

Descriptors: (*Impact tests, *Fracture (Mechanics)), Steel, Pressure vessels, Nuclear reactors, Tensile properties, Ductility, Fatigue (Mechanics), Crack propagation, Dynamics.

The use of an instrumented impact hammer on pre-cracked Charpy V-notch specimens led to a reliable and inexpensive method for determining dynamic fracture toughness. Measurements were made on A-533, Grade B, Class 1 steel from -125F to +75F. The data were found to be in excellent agreement with those obtained by other workers on much larger specimens. Similar tests were run with standard Charpy V-notch specimens to determine dynamic tensile yield strength values. A comparison of the dynamic yield and toughness values suggests a meaningful technique for estimating the NDT temperature, which should be of practical value in nuclear reactor surveillance programs. (Author)

AD-750 867 PC$3.00/MF$0.95
Arnold Engineering Development Center Arnold Air Force Station Tenn
A STUDY OF THE JET STRETCHER CONCEPT FOR ANGLE-OF-ATTACK TESTING.
Final rept. 1 Jul 70-30 Jun 71,
R. C. Bauer, R. L. Barebo, and E. H. Matkins. Oct 72, 45p Rept no. AEDC-TR-72-150
Contract F40600-73-C-0004
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn. Rept. no. ARO-ETF-TR-72-103.

Descriptors: (*Supersonic wind tunnels, *Wind tunnel nozzles), Guided missile models, Flow fields, Model tests, Adapters, Angle of attack, Design, Feasibility studies.

Identifiers: *Jet stretchers.

The feasibility of using a porous, axisymmetric jet stretcher for angle-of-attack testing of missiles having aft-located engine inlets was demonstrated. Initially, an analytical technique was developed for evaluating the performance of a jet stretcher and was applied to a small-scale experimental jet stretcher system for test body angles of attack of 4 and 8 deg. For each test body angle of attack the analytical technique was used to determine the optimum position of the jet stretcher and the regions on the jet stretcher that require porosity. (Author)

AD-750 885 PC$3.00/MF$0.95
Westinghouse Electric Corp Pittsburgh Pa Astronuclear Lab
MATHEMATICAL CALIBRATION OF THE RING TEST WITH BULGE FORMATION.
Technical rept. 1 Jan-30 Nov 71,
Vincent De Pierre, Fred Gurney, and Alan T.
Male. Mar 72, 37p AFML-TR-72-37
Contract F33615-71-C-1163

Descriptors: (*Tests, Friction), Calibration, Mathematical analysis, Deformation, Aluminum, Steel, Copper, Brass.
Identifiers: *Ring tests.

An available mathematical solution of ring compression with bulge formation was used to calibrate ring test specimens on the basis of constant interface friction factor, m. Calibration curves for the 6:3:2 (Outside Diameter: Inside Diameter: Thickness) and other ring geometries were obtained by mathematical computation and a method was established for calibrating all ring geometries with bulge formation. Calculated calibration curves of the 6:3:2 ring showed very good correlation with experimentally determined interface friction factors, m. The investigation demonstrated that a valid mathematical solution of ring compression can be used for more accurate and less laborious calibration than experimental calibration of ring test specimens. (Author)

AD-750 915 PC$4.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
STUDY OF LIQUID VISCOSITY BY MEANS OF VIBRATION METHOD,
V. N. Genrikh, A. B. Kaplum, and A. N. Solovev.
18 Aug 72, 40p Rept no. FTD-HT-23-332-72
Edited trans. of mono. Issledovaniya Teplofizicheskikh Svoistv Veshchestv (Studies of the Thermophysical Properties of Substances) Novosibirsk, 1967 p112-136, by Victor Mesenzeff.

Descriptors: (*Viscosity, Measurement), (*Liquid metals, Viscosity), Temperature, Accuracy, Calibration, Lubricants, Vibration, Gallium, USSR.
Identifiers: Translations.

The viscostiy of Gallium during supercooling was measured. Gallium was melted, after which the temperature was quickly lowered to a given value. It is then held const. for 2-3 hrs. as the viscosity was measured. Gallium was subsequently headted to 95-8 degrees and again the viscosity was determined, Quick raising and lowering of temperature guarantees preservation of solid phase residues at temperatures greater than the melting point and does not allow the emergence of the solid phase during cooling. (Author)

COM-72-50033-10
PC-GPO/MF$0.95-NTIS
National Bureau of Standards, Washington, D.C.
TECHNICAL NEWS BULLETIN. VOLUME 56, NUMBER 10, OCTOBER 1972.
Monthly rept.
Oct 72, 24p NBS-TNB-56/10
Library of Congress Catalog Card no. 25-26527.
Paper copy available from GPO $3.00/year as C13.13:56, $0.30/copy as C13.13:56/10.

Descriptors: (*Periodicals, Research projects), Standards, Metric system, Atomic clocks, Air pollution, Sulfur dioxide, Monitors, Spectrophotometers.
Identifiers: National Bureau of Standards, Technical News Bulletins, Standard reference materials.

Contents:
- New environmental radioactive pollutant standards issued;
- Metric conversion card;
- Atomic clocks;
- Sulfur dioxide pollution monitor developed;
- Towards international standardization;
- Highly accurate spectrophotometer developed;
- New center for building technology created;
- NBS helps guide foreign computer technology;
- NSRDS news;
- Optical radiation news;
- New resolution test sample for scanning electron microscopes;
- Additional interlaboratory reference tests for paper and rubber;
- Publications of the National Bureau of Standards.

N72-28252 PC$8.25/MF$0.95
Texas Univ., Austin. Dept. of Mechanical Engineering.
UTILIZATION OF A CRT DISPLAY LIGHT PEN IN THE DESIGN OF FEEDBACK CONTROL SYSTEMS.
Final Report
J. G. Thompson, and K. R. Young. May 72, 125p
NASA-CR-115741
Contract NAS9-7926

Descriptors: *Computer graphics, *Computer programming, *Computerized simulation, Computerized design, Error analysis, Transfer functions.

For abstract, see STAR 10 19.

N72-28259 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EVALUATION OF A SELF-ASPIRATING LOCAL TOTAL ENTHALPY PROBE IN A LOW-DENSITY ARC-HEATED HYPERSONIC WIND TUNNEL.
R. W. Guy, and A. G. Kantsios. Aug 72, 23p
NASA-TM-X-2591, L-8248

Descriptors: *Enthalpy, *Heat measurement, *Hypervelocity wind tunnels, *Measuring instruments, Free flow, Gas temperature, Velocity measurement.

For abstract, see STAR 10 19.

N72-28260 PC$3.00/MF$0.95
Weapons Research Establishment, Salisbury (Australia).
THE DEVELOPMENT OF A GAS GUN TO STUDY THE SUBSONIC FLIGHT OF PROJECTILES.
R. E. Dudley. Apr 72, 20p WRE-TN-639 (WR+D)

Descriptors: *Gas guns, *Hypervelocity projectiles, *Structural design, Gun launchers, Performance tests, Pressure regulators.

For abstract, see STAR 10 19.

N72-28439 PC$4.00/MF$0.95
Oklahoma Univ. Research Inst., Norman.
DEVELOPMENT OF PIEZOELECTRIC SKIN FRICTION FORCE VECTOR TRANSDUCER FOR A HYPERSONIC WIND TUNNEL.
Final Report, 1 Aug. 1969 - 30 Nov. 1971
S. K. Kahng. May 72, 36p NASA-CR-127447
Contract NGR-37-003-045

Descriptors: *Aerodynamic configurations, *Force distribution, *Hypervelocity wind tunnels, *Piezoelectric transducers, Equipment specifications, Performance tests, Wind tunnel apparatus.

For abstract, see STAR 10 19.

PAT-APPL-258464 PC$3.00/MF$0.95
General Dynamics Corp., San Diego, Calif.
MULTI-WIRE HIGH TEMPERATURE THERMOCOUPLE.
Patent Application
J. H. Sleigh, Jr., and D. E. Schwarzer. Filed 31 May 72, 8p NASA-CASE-LEW-10854-2
Subm- Sponsored By Nasa
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *High temperature environments, *Systems engineering, *Thermocouples, Patent applications, Sheaths, Stresses.

A sheathed thermocouple probe is made by inserting an end of each of a pair of thermocouple wires into a cavity or passageway in a plug which is then compressed by swaging to squeeze the wires together. Some BeO beads are then strung on the thermocouple loads and the whole assembly inserted into a cylindrical tube or a sheath. One end of the sheath may be swaged onto the plug, if desired, and the ends may be closed by welding whether or not the plug is swaged into the sheath.

PAT-APPL-258152 PC$3.50/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
NEW USE OF THIN FILM LIGHT DETECTOR.
Patent Application
J. Maserjian, and G. W. Lewicki. Filed 31 May 72, 26p NASA-CASE-NPO-11432-2
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Barrier layers, *Mis (semiconductors), *Photovoltaic cells, *Thin films, Light (visible radiation), Optical measurement, Patent applications.

The new use of a metal-insulator-metal (MIM) structure having a thin film base and a thin film insulator is reported. This structure provides a sensitive light detector with or without a bias. The insulator provides a trapezoidal barrier instead of the Schottky barrier characteristic of a semiconductor layer between two metals.

PAT-APPL-254323 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THERMOCOUPLE TAPE.
Patent Application
R. D. Thomas. Filed 17 May 72, 12p
NASA-CASE-LEW-11072-2
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Electrical properties, *Equipment specifications, *Metals, *Thermocouples, Electrical resistivity, Patent applications, Thermodynamic properties.

A thermocouple which may be rolled as a tape until needed and a method of making the tape are described. Thermoelectrically different metals are applied to a strip of electrically nonconductive material in longitudinally overlapping relationship. Apertures may be provided along the tape in the overlapping region at predetermined intervals. An adhesive material is applied to the side of the tape opposite the thermoelectrical metals either before or after the thermoelectric metals are deposited. The tape may be cut or torn to form a thermocouple device which is ready for application to a body whose temperature is to be monitored or measured.

N72-28444 PC$4.75/MF$0.95
Ludwig-maximilians-universitat, Munich (West Germany). Meteorologisches Inst.
RADIOMETERS FOR OH-EMISSION STUDIES FROM ROCKETS.
W. Bangert, E. Krieg, and R. Scheidle. Apr 72, 55p
BMBW-FB-W-72-07
Subm- Sponsored By Bundesministerium Fuer Bildung Und Wiss.

Descriptors: *Hydroxyl emission, *Radiometers, *Rocket-borne instruments, Aerobee rocket vehicle, Radiation measuring instruments.

For abstract, see STAR 10 19.

N72-28445 PC$3.25/MF$0.95
Ludwig-maximilians-universitat, Munich (West Germany). Meteorologisches Inst.
AN AIRBORNE EIGHT CHANNEL STEP-SCAN RADIOMETER.
H. Bolle, and K. T. Kriebel. Apr 72, 25p
BMBW-FB-W-72-13
Subm- Sponsored By Bundesministerium Fuer Bildung Und Wiss.

Descriptors: *Aircraft equipment, *Radiant flux density, *Radiometers, Onboard equipment, Radiation measuring instruments, Scanners.

For abstract, see STAR 10 19.

N72-28447 PC$4.50/MF$0.95
Ludwig-maximilians-universitat, Munich (West Germany). Meteorologisches Inst.
ROCKET-BORNE RADIOMETERS FOR THE DETERMINATION OF DENSITY PROFILES OF MINOR ATMOSPHERIC CONSTITUENTS.
P. Burkert, and D. Rabus. Apr 72, 48p
BMBW-FB-W-72-11
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Atmospheric attenuation, *Radiometers, *Rocket-borne instruments, *Solar radiation, Aerobee rocket vehicle, Calibrating, Infrared detectors, Radiation measuring instruments.

For abstract, see STAR 10 19.

N72-28448 PC$6.00/MF$0.95
Ludwig-maximilians-universitat, Munich (West Germany). Meteorologisches Inst.
TWO CHANNEL RADIOMETER FOR THE DETERMINATION OF O2-CONCENTRATION IN THE THERMOSPHERE.
L. Bierling, and H. Bolle. Apr 72, 76p
BMBW-FB-W-72-10
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Gas composition, *Oxygen, *Radiometers, *Thermosphere, Onboard equipment, Optical measurement, Satellite observation.

For abstract, see STAR 10 19.

N72-28454 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SENSITIVITY OF HOT-CATHODE IONIZATION VACUUM GAGES IN SEVERAL GASES.
R. Holanda. Jul 72, 21p NASA-TN-D-6815, E-6759

Descriptors: *Cathodes, *Ionization, *Vacuum gages, Electric potential, Sensitivity.

For abstract, see STAR 10 19.

N72-28456 PC$5.25/MF$0.95
Barnes Engineering Co., Stamford, Conn.
DEVELOPMENT OF IMPROVED PYROELECTRIC DETECTORS MEASUREMENTS OF PYROELECTRIC MATERIAL CHARACTERISTICS AND FET CHARACTERISTICS.
Quarterly Technical Report, 23 Feb. - 22 May 1972
S. Weiner, and H. Beerman. 28 Jul 72, 65p
NASA-CR-122446, BEC-2064QR3
Contract NAS5-21655

Descriptors: *Pyroelectricity, *Temperature measuring instruments, *Thermoelectric materials, Dielectric properties, Operational problems, Semiconductors (materials), Thermal noise.

For abstract, see STAR 10 19.

N72-28459 PC$7.00/MF$0.95
Harvard Coll. Observatory, Cambridge, Mass.
TO INSTRUMENT A SOLAR POINTED SPECTROMETER SPECTROHELIOMETER FOR OSO-G.
Final Report
L. Goldberg. May 72, 98p NASA-CR-122505
Contract NAS5-9274

Descriptors: *Oso, *Spectroheliographs, *Spectrometers, *Structural design, Performance tests, Postflight analysis, Satellite-borne instruments.

For abstract, see STAR 10 19.

N72-28460 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AN APPARATUS USED IN THE CALIBRATION OF ULTRA HIGH VACUUM SYSTEM.
Patent Application
R. A. Outlaw, R. E. Stell, and R. F. Hoyt. Filed 14 Jul 72, 16p NASA-CASE-LAR-10862-1, US-PAT-APPL-271951
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Calibrating, *Ultrahigh vacuum, Compacting, Patent applications, Solid solutions.

For abstract, see STAR 10 19.

PAT-APPL-266911 PC$3.00/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
APPARATUS FOR SCANNING THE SURFACE OF A CYLINDRICAL BODY.
Patent Application
R. B. Nakich, and R. C. Woodbury. Filed 28 Jun 72, 19p NASA-CASE-NPO-11861-1
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Cylindrical bodies, *Display devices, *Laser outputs, *Surface properties, Cathode ray tubes, Display devices, Patent applications.

An apparatus for providing a two dimensional display of a cylindrical surface is described. The device has application for displaying the markings on a fired bullet. The device used laser beams and vibrating mirrors to deflect the laser beams. A cathode ray tube is used to display the two dimensional effect obtained from the laser illumination. The application for surface analysis of precision shafts used in rotating machinery is also recommended.

PAT-APPL-239577 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A SYSTEM FOR CALIBRATING PRESSURE TRANSDUCER.
Patent Application
G. N. Rollins. Filed 30 Mar 72, 18p
NASA-CASE-LAR-10910-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Electrical properties, *Infrared detectors, *Radiation measurement, Domains, Patent applications.

An infrared detector composed of a cadmium sulfide (CdS) platelet is described. The platelet has a cathode formed on one end and an anode formed on the other end. The platelet is suitably doped such that stationary high field domains are formed adjacent the cathode when biased in the negative differential conductivity region. A negative potential is applied to the cathode such that a high field domain is formed adjacent to the cathode. A potential measuring probe is located between the cathode and the anode at the edge of the high field domain and means are provided for measuring the potential at the probe whereby this measurement is indicative of the infrared radiation striking the platelet.

N72-28465 PC$3.75/MF$0.95
Toronto Univ. (Ontario). Inst. for Aerospace Studies.
THE THREE DIMENSIONAL QUADRUPOLE MASS SPECTROMETER.
S. Mastoris. Jan 72, 34p UTIAS-TN-172

Descriptors: *Mass spectrometers, *Quadrupoles, Fluid filters, Gas analysis, Ionization, Vacuum gages.

For abstract, see STAR 10 19.

N72-28467 PC$6.50/MF$0.95
Lockheed Missiles and Space Co., Palo Alto, Calif. Research Labs.
MICROPHONE DENSITY GAGE EXPERIMENT FOR OGO-F.
Final Report
Jul 72, 87p NASA-CR-122510, LMSC/L-73-72-1
Contract NAS5-9334

Descriptors: *Atmospheric density, *Density measurement, *Microphones, *Ogo-f, Failure analysis, Measuring instruments, Solar activity.

For abstract, see STAR 10 19.

N72-28471 PC$3.50/MF$0.95
Communications Research Centre, Ottawa (Ontario).
MICROWAVE RADIOMETRY FOR SURVEILLANCE FROM SPACECRAFT AND AIRCRAFT.
A. W. Adey. Jan 72, 30p

Descriptors: *Airborne equipment, *Radiometers, *Remote sensors, *Satellite observation, Equipment specifications, Optical equipment, Research projects.

For abstract, see STAR 10 19.

N72-28475 PC$4.00/MF$0.95
Royal Aircraft Establishment, Farnborough (England). Structures Dept.
A PARALLEL MOTION CREEP EXTENSOMETER.
Aeronautical Research Council Current Papers
J. N. Webb. 1971, 38p ARC-CP-1173, RAE-TR-70068
Misc 0supersedes Rae-tr-70068 Arc-32319

Descriptors: *Creep properties, *Extensometers, Loads (forces), Magnetic properties.

For abstract, see STAR 10 19.

N72-28477 PC$5.00/MF$0.95
Istituto Di Fisica Dell Atmosfera, Rome (Italy).
RADIOGONIOMETER FOR ATMOSPHERIC (LIGHTING DIRECTION FINDER) . RADIOGONIOMETRO PER ATMOSFERICI.
M. Severini, and U. Guiducci. Mar 71, 59p
IFA-TR-36
LANG- IN ITALIAN ENGLISH SUMMARY

Descriptors: *Data processing, *Lightning, *Radiogoniometers, Atmospherics, Digital data, Direction, Signal detectors, Thunderstorms.

For abstract, see STAR 10 19.

N72-28478 PC$3.00/MF$0.95
Ernst-mach-inst., Freiburg (West Germany).
A SIMPLE LIGHT-SCREEN TRIGGER SYSTEM USING A HELIUM NEON LASER . AUFBAU EINES EINFACHEN LICHTSCHRANKENSYSTEMS MIT EINEM HE-NE-LASER.
A. Stilp, and H. Giesbrecht. Jun 71, 14p
REPT-4/71
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Helium-neon lasers, *Hypervelocity projectiles, *Trigger circuits, *Velocity measurement, Flow visualization, Hypervelocity wind tunnels, Mirrors, Photodiodes.

For abstract, see STAR 10 19.

N72-28501 PC$7.00/MF$0.95
Mechanical Technology, Inc., Latham, N.Y.
DESIGN AND FABRICATION OF PROTOTYPE SYSTEM FOR EARLY WARNING OF IMPENDING BEARING FAILURE.
J. J. Broderick, R. F. Burchill, and H. L. Clark. Jan 72, 97p NASA-CR-123717, MTI-71TR1
Contract NAS8-25706

Descriptors: *Ball bearings, *Failure, *Prototypes, Loads (forces), Lubrication, Ultrasonic radiation.

For abstract, see STAR 10 19.

N72-28728 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A VERSATILE MOSSBAUER SPECTROMETER AND ITS APPLICATIONS IN VIBRATION MEASUREMENT.
J. J. Singh, and L. M. Howser. Aug 72, 41p
NASA-TN-D-6819, L-8318

Descriptors: *Mossbauer effect, *Spectrometers, *Steels, Vibration.

For abstract, see STAR 10 19.

N72-28940 PC$5.00/MF$0.95
Weapons Research Establishment, Salisbury (Australia).
WEAPONS RESEARCH, DEVELOPMENT, AND ENGINEERING ACTIVITIES TRIAL RANGES.
Annual Report, 1970-1971
1972, 57P

Descriptors: *Australia, *Research and development, *Test ranges, *Weapon systems, Ballistic vehicles, Military technology, Ordnance, Production engineering, Weapons development.

For abstract, see STAR 10 19.

N72-29217 PC$3.25/MF$0.95
National Physical Lab., Teddington (England). Metrology Centre.
RECOMMENDATIONS FOR THE DESIGN AND EQUIPPING OF ENGINEERING METROLOGY LABORATORIES.
T. R. Oakley. May 72, 24p NPL-MC-4-REV
Misc 0revised

Descriptors: *Laboratory equipment, *Metrology, *Structural design, Bibliographies, Equipment specifications, Systems engineering.

For abstract, see STAR 10 20.

N72-29248 PC$3.25/MF$0.95
Royal Aircraft Establishment, Teddington (England). Aerodynamics Dept.
A COMPARISON BETWEEN TWO METHODS OF ANALYSIS OF OSCILLATORY PRESSURE MEASUREMENTS, ONE METHOD REQUIRING THE USE OF A TAPE RECORDER.
A. W. Moore, and B. L. Welsh. 1972, 25p
ARC-CP-1205, RAE-TR-71203
Misc 0supersedes Rae-tr-71203 Arc-33470

Descriptors: *Pressure measurements, *Pressure oscillations, *Tape recorders, Dynamic response, Pressure sensors, Signal analysis, Wind tunnel models, Wing oscillations.

For abstract, see STAR 10 20.

N72-29468 PC$4.75/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PRECISE LINEAR SUN SENSOR.
D. D. Johnston. 9 Jun 72, 53p NASA-TM-X-64649

Descriptors: *Performance tests, *Solar sensors, Collimation, Electronic equipment, Errors, Guidance sensors, Solar simulation, Systems analysis.

For abstract, see STAR 10 20.

N72-29469 PC$3.00/MF$0.95
TRW Systems, Redondo Beach, Calif.
MULTIWIRE PROPORTIONAL COUNTER DEVELOPMENT.
Quarterly Progress Report
31 Jan 72, 14p NASA-CR-115732
Contract NAS9-11315

Descriptors: *Alpha particles, *Display devices, *Proportional counters, *Spectrometers, *Systems engineering, Charged particles, Electrons.

For abstract, see STAR 10 20.

N72-29470 PC$10.25/MF$0.95
Hoverproducts Ltd., Ottawa (Ontario).
CARSP EXPLORATORY SYSTEMS STUDY INVESTIGATING THE SUITABILITY OF AEROSTATS FOR REMOTE SENSING PLATFORM APPLICATIONS.
L. X. Pomerlean. 20 Nov 70, 165p
Contract HPL PROJ. H-038-1
Subm- Sponsored By Geol. Survey of Canada

Descriptors: *Aerial photography, *Data collection platforms, *Remote sensors, Earth resources, Feasibility, Imaging techniques, Man machine systems.

For abstract, see STAR 10 20.

N72-29471 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
ANALYTICAL DESIGN OF SENSORS FOR MEASURING DURING TERMINAL PHASE OF ATMOSPHERIC TEMPERATURE PLANETARY ENTRY.
J. P. Millard, M. J. Green, and S. C. Sommer. Aug 72, 28p NASA-TN-D-6947, A-4412

Descriptors: *Planetary atmospheres, *Planetary temperature, *Temperature measurement, *Thermocouples, Equipment specifications, Product development, Supersonic speeds.

For abstract, see STAR 10 20.

N72-29473 PC-GPO/MF$0.95
National Bureau of Standards, Washington, D.C. Heat Div.
FUNDAMENTAL PRINCIPLES OF ABSOLUTE RADIOMETRY AND THE PHILOSOPHY OF THIS NBS PROGRAM (1968 TO 1971).
J. Geist. Jun 72, 63p NASA-CR-127780,
NBS-TN-594-1
NASA ORDER C-41584-B
Paper copy available from GPO $0.60.

Descriptors: *Calibrating, *Radiometers, *Systems engineering, Errors, Irradiance, Standards.

For abstract, see STAR 10 20.

N72-29476 PC$3.50/MF$0.95
National Physical Lab., Teddington (England). Div. of Quantum Metrology.
DEVELOPMENT OF A CRYOGENIC JOSEPHSON VOLT APPARATUS.
J. C. Gallop. Apr 72, 29p NPL-QU-22

Descriptors: *Cryogenics, *Electric potential, *Josephson junctions, *Plancks constant, Calibrating, Electrical measurement, Flux quantization, Standards, Volt-ampere characteristics.

For abstract, see STAR 10 20.

N72-29535 PC$3.00/MF$0.95
National Physical Lab., Teddington (England). Metrology Centre.
COMPARISON OF INTERNATIONAL ROCKWELL C AND VICKERS HV 30 HARDNESS SCALES DURING 1970 AND 1971.
R. S. Marriner, and J. G. Wood. May 72, 16p
NPL-MC-8

Descriptors: *Hardness tests, *International cooperation, *Rockwell hardness, Accuracy, Deformation, Materials tests, Standardization.

For abstract, see STAR 10 20.

N72-29597 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ADHESION AND TRANSFER OF POLYTETRAFLUOROETHYLENE TO TUNGSTEN STUDIED BY FIELD ION MICROSCOPY.
W. A. Brainard, and D. H. Buckley. Aug 72, 21p
NASA-TN-D-6887, E-6919

Descriptors: *Adhesion tests, *Polytetrafluoroethylene, *Tungsten, Adhesive bonding, Creep properties, Electric fields, Ion microscopes, Loads (forces).

For abstract, see STAR 10 20.

N72-29673 PC$6.00/MF$0.95
Centre National de La Recherche Scientifique, Toulouse (France). Lab. Dautomatique Et de Ses Applications Spatiales.
REPORT ON WORK PERFORMED UP TO 22 DECEMBER 1971 ON THE PNEUMATIC PLATFORM . COMPTE RENDU DES TRAVAUX EFFECTUES SUR LA TABLE A AIR AU 22DECEMBRE 1971.
G. Bauzil, and G. Vialaret. 1971, 76p
LAAS-NI-MCI-71-07

Descriptors: *Control simulation, *Pneumatic equipment, *Satellite attitude control, Control valves, Light sources, Longitudinal control, Mass distribution, Optical measuring instruments, Pitch (inclination).

For abstract, see STAR 10 20.

N72-29850 PC$3.00/MF$0.95
Royal Greenwich Observatory, Herstmonceux (England). Time and Latitude Service.
GREENWICH TIME REPORT.
Quarterly Report, Jul. - Sep. 1971
R. Vdrwoolley. Sep 71, 18p

Descriptors: *Frequency standards, *Latitude, *Radio astronomy, *Time signals, Astronomical observatories, Geodetic coordinates, Radio emission, Universal time.

For abstract, see STAR 10 20.

N72-30245 PC$3.75/MF$0.95
Chrysler Corp., Huntsville, Ala.
AERONAUTICAL NOISE SUPPRESSION AT TRANSONIC MACH NUMBERS.
Final Report
G. F. Mccanless, Jr. 24 May 72, 34p
NASA-CR-123810, HSM-R5-72
Contract NAS8-27503

Descriptors: *Aerospace vehicles, *Pressure distribution, *Pressure gradients, *Wind tunnels, Calibrating, Data acquisition, Numerical analysis, Test facilities.

For abstract, see STAR 10 21.

N72-30247 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ADVANCES IN MEASURING TECHNIQUES FOR TURBINE COOLING TEST RIGS.
Status Report
F. G. Pollack. 1972, 20p NASA-TM-X-68100, E-7016
Conf- Presented At Symp. on Instrumentation for Airbreathing Propulsion, Monterey, Calif., 19-21 Sep. 1972

Descriptors: *Infrared photography, *Surface temperature, *Temperature measurement, *Turbine instruments, Stator blades, Test facilities, Turbine blades.

For abstract, see STAR 10 21.

N72-30249 PC$3.75/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
AN ANECHOIC CHAMBER FACILITY FOR INVESTIGATING AERODYNAMIC NOISE.
P. F. Massier, and S. P. Parthasarathy. 15 Sep 72, 32p NASA-CR-128038, JPL-TR-32-1564
Contract NAS7-100

Descriptors: *Acoustic measurements, *Anechoic chambers, *Jet aircraft noise, *Structural design, Aerodynamic noise, Calibrating, Fluid dynamics, Noise generators, Subsonic aircraft, Supersonic aircraft.

For abstract, see STAR 10 21.

N72-30396 PC$3.50/MF$0.95
Naval Research Lab., Washington, D.C. Space Science Div.
THE NRL OSO-4 BRAGG CRYSTAL SPECTROMETER INSTRUMENT.
Interim Report
J. F. Meekins. 27 Jul 72, 25p NASA-CR-127857, NRL-7423
Subm- Sponsored By Nasa

Descriptors: *Data reduction, *Oso-e, *Satellite instruments, *X ray spectroscopy, Solar flares, Spectrometers.

For abstract, see STAR 10 21.

N72-30398 PC$8.00/MF$0.95
Zenith Radio Corp., Evanston, Ill. Government Engineering Dept.
NEUTRON RADIOGRAPHIC VIEWING SYSTEM.
Final Report
Feb 72, 118p NASA-CR-123802, REPT-8661-FER
Contract NAS8-30070

Descriptors: *Display devices, *Nondestructive tests, *Radiography, *Structural design, Image intensifiers, Neutron activation analysis.

For abstract, see STAR 10 21.

N72-30403 PC$12.25/MF$0.95
IIT Research Inst., Chicago, Ill.
INVESTIGATION OF THE USE OF MICROWAVE IMAGE LINE INTEGRATED CIRCUITS FOR USE IN RADIOMETERS AND OTHER MICROWAVE DEVICES IN X-BAND AND ABOVE.
Final Report
R. M. Knox, P. P. Toulios, and G. Y. Onoda. Aug 72, 204p NASA-CR-112107
Contracts NAS1-10716, IITRI PROJ. E6200

Descriptors: *Dielectrics, *Integrated circuits, *Microwave circuits, *Millimeter waves, *Waveguides, Imagery, Microwave radiometers, Permittivity, Superhigh frequencies.

For abstract, see STAR 10 21.

N72-30412 PC$5.50/MF$0.95
Max-planck-institut Fuer Stromungsforschung, Gottingen (West Germany).
VELOCITY MEASUREMENTS IN FLUIDS BY THE OPTICAL DOPPLER EFFECT.
H. H. Bossel, W. J. Hiller, and G. E. Meier. Oct 71, 70p REPT-7/1971
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Doppler effect, *Flow velocity, *Light beams, *Velocity measurement, Beam splitters, Fluid flow, Lasers, Photodiodes, Polarized light, Prisms, Signal to noise ratios.

For abstract, see STAR 10 21.

N72-30562 PC$3.00/MF$0.95
Istituto Di Fisica Dell Atmosfera, Rome (Italy).
RAPID EVALUATION OF DIFFERENTIAL SAMPLING (CONCENTRATION COMPARISON COUNTING METHOD) . LAPPREZZAMENTO RAPIDO DI UN CAMPIONAMENTO DIFFERENZIALE (METODICA DI CONTEGGIO PER COMPARAZIONE DI CONCENTRAZIONE).
L. Mammarella. Jan 71, 20p IFA-RDP-37

Descriptors: *Aerosols, *Air pollution, *Air sampling, Cascades, Dust collectors, Impactors, Particle density (concentration), Samplers.

For abstract, see STAR 10 21.

N72-30609 PC$11.50/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Brunswick (West Germany). Inst. Fuer Flugfuehrung.
MEASUREMENT TECHNIQUE USING ELECTROMAGNETIC SUSPENSION . EIN BETRAG ZUR MESSTECHNISCHEN ANWENDUNG DER AKTIVEN ELEKTROMAGNETISCHEN LAGERUNG.
Ph.D. Thesis - Brunswick Univ.
W. Klimek. Mar 72, 190p DLR-FB-72-30
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Acceleration (physics), *Dynamic stability, *Electromagnetic fields, *Magnetic measurement, *Magnetic suspension, Automatic control, Electromagnets, Hysteresis, Servocontrol.

For abstract, see STAR 10 21.

N72-30747 PC$6.25/MF$0.95
Laboratoire Central de Recherches Thomson, Orsay (France).
SECONDARY ELECTRON MICROSCOPE SCANNING OF MATERIAL SAMPLES FOR OPTIMUN USAGE OF THIS DEVICE AND INTERPRETATION OF RESULTS . ETUDE DECHANTILLONS DE DIVERS MATERIAUX AVEC UN MICROSCOPE ELECTRONIQUE SECONDAIRE A BALAYAGE EN VUE DE PRECISER LES NORMES DUNE UTILISATION OPTIMALE DE CET APPAREIL ET LINTERPRETATION DES OBSERVATIONS RAPPORT FINAL.
Final Report
G. Blet, and R. Ansel. 1971, 82p
Contract DGRST-68-01-362-00-212-75-01

Descriptors: *Chemical elements, *Electron microscopes, *Image contrast, *Scanners, *Secondary emission, Atomic weights, Cathode ray tubes, Electron beams, Electron energy, Imaging techniques, Thin films.

For abstract, see STAR 10 21.

PB-212 658 PC$3.00/MF$0.95
Bureau of Mines, Washington, D.C.
A SOLID-STATE AMPLIFIER FOR THE BRIDGE CIRCUIT OF A MERCURY DETECTOR.
Rept. of Investigations,
C. Melvin Lepper. Sep 72, 15p BuMines-RI-7676
Prepared in cooperation with Bureau of Mines, Denver, Colo. Denver Mining Research Center.

Descriptors: (*Gas detectors, Mercury), (*Electric bridges, Gas detectors), Amplifiers, Mining engineering, Vapors.

A solid-state amplifier for the bridge circuit of an atomic absorption mercury detector is presented and described. Operational advantages over previously used circuitry include improved time and temperature stability, increased measurement accuracy, and simplified setup, calibration and operation. (Author)

14C. Recording Devices

AD-750 700 PC$3.00/MF$0.95
Royal Aircraft Establishment Farnborough (England)
FLUTTER COMPENSATION OF DATA RECORDED ON MAGNETIC TAPE IN A SEVERE ENVIRONMENT.
Technical rept.,
G. R. Labrum. May 72, 37p Rept no. RAE-TR-72028 DRIC-BR-29354

Descriptors: (*Magnetic recording systems, Errors), Frequency modulation, Flutter, Aerodynamic noise, Signal-to-noise ratio, Corrections, Great Britain.
Identifiers: Magnetic tape transports.

The report discusses the theoretical performance of subtractive and multiplicative techniques for the compensation of tape flutter error in frequency modulation magnetic recording. It is assumed that in a severe environment the predominant flutter occurs in the record operation. The effect of tape skew and differential phase shift in the electronic circuits are taken into account. The results are illustrated by reference to typical tape transports, of known performance, for use where space is limited and the environment severe. It is deduced that even under these conditions both compensation techniques can result in a significant reduction in the error due to tape flutter, but that there are circumstances for which the additional complexity of multiplicative compensation would not be justified. (Author)

N72-28168 PC$3.25/MF$0.95
Aeronautical Research Labs., Melbourne (Australia).
THE RECORDING AND REPRODUCING OF VOICE AND A SPEED CONTROL SIGNAL USING A SINGLE MAGNETIC TAPE TRACK.
M. D. Card. Jan 72, 21p ARL/FL-NOTE-47

Descriptors: *Frequency control, *Magnetic recording, *Speed regulators, *Voice communication, Demodulators, Magnetic tapes, Modulators, Speed control.

For abstract, see STAR 10 19.

N72-28169 PC$9.00/MF$0.95
Technische Hochschule Hannover (West Germany). Fakultaet Fuer Maschinenwesen.

ANALYSIS OF THE MAGNETIC TAPE RECORDING PROCESS WITH HIGH FREQUENCY PREMAGNETIZATION USING THE PREISACH MODEL . EIN BEITRAG ZUR ANALYSE DES MAGNETBAND-AUFZEICHNUNGSVORGANGS MIT HOCHFREQUENZVORMAGNETISIERUNG UNTER VERWENDUNG DES PREISACH--MODELLS.
Ph.D. Thesis
B. Morgenstern. 1971, 137p

Descriptors: *Energy distribution, *Magnetic tapes, *Tape recorders, *Three dimensional motion, Hysteresis, Magnetic dispersion, Magnetic fields.

For abstract, see STAR 10 19.

N72-28170 PC$8.00/MF$0.95
Technische Hochschule Hannover (West Germany). Fakultaet Fuer Maschinenwesen.
THE MAGNETIZATION DISTRIBUTION IN MAGNETIC TAPE AND ITS CONNECTION WITH OPTIMAL USE OF THE TAPE FOR MAXIMUM READING SIGNALS . DIE MAGNETISIERUNGSVERTEILUNG IM MAGNETBAND UND IHR ZUSAMMENHANG MIT DER OPTIMALEN AUSNUTZUNG DES BANDES FUER MAXIMALE LESESIGNALE.
Ph.D. Thesis
J. Hersener. 1971, 119p

Descriptors: *Magnetic dispersion, *Magnetic recording, *Magnetic storage, *Magnetic tapes, Electric fields, Magnetic fields, Magnetic flux.

For abstract, see STAR 10 19.

N72-28175 PC$3.75/MF$0.95
Royal Aircraft Establishment, Farnborough (England).
DAMIEN 3 PCM RECORDING SYSTEM AND PROGRAMMING FOR FLIGHT TESTS.
Jun 72, 32p RAE-LIB-TRANS-1638, BR-29648
Tran- Transl. Into English From Sfim (France), Jul. 1971, Oct. 1971

Descriptors: *Flight recorders, *Flight tests, *Pulse code modulation, *Test equipment, Commutators, Data acquisition, Recording instruments.

For abstract, see STAR 10 19.

N72-30146 PC$13.75/MF$0.95
IIT Research Inst., Chicago, Ill.
DESIGN STUDY FOR A HIGH RELIABILITY FIVE-YEAR SPACECRAFT TAPE TRANSPORT.
Final Report
G. S. Benn, and R. L. Eshleman. Nov 71, 235p
NASA-CR-122453
Contracts NAS5-21556, IITRI PROJ. E6179

Descriptors: *Magnetic tapes, *Spacecraft electronic equipment, Reliability analysis, Transport properties.

For abstract, see STAR 10 21.

N72-30409 PC$4.00/MF$0.95
Laboratoire Central de Recherches Thomson, Orsay (France).
APPLICATION OF PHOTOCHROMIC PROCEDURES TO THE OPTICAL PROCESSING OF ELECTRIC SIGNALS . UTILISATION DE PROCEDES PHOTOCHROMIQUES POUR LE TRAITEMENT OPTIQUE DE SIGNAUX ELECTRIQUES RAPPORT FINAL.
Final Report
J. C. Bellamy. 16 Mar 70, 40p
LCR-DR-1-70-44/1/R
Contract DRME-67-34-424

Descriptors: *Electro-optical effect, *Optical data processing, *Photochromism, *Signal processing, Electroacoustic transducers, Performance tests, Photographic film, Photosensitivity, Refractivity, Sonar.

For abstract, see STAR 10 21.

N72-30444 PC$4.25/MF$0.95
Isomet Corp., Oakland, N.J.
DYNAMIC HOLOGRAPHIC STORAGE IN LITHIUM NIOBATE.
Final Report
H. Aronson. May 72, 45p NASA-CR-123770
Contract NAS8-26635

Descriptors: *Data storage, *Holography, *Lithium compounds, *Niobates, Additives, Copper, Iron, Manganese, Optical properties, Photosensitivity.

For abstract, see STAR 10 21.

14D. Reliability

AD-750 690 PC$3.00/MF$0.95
Stanford Univ Calif
ASSEMBLY OF SYSTEMS HAVING MAXIMUM RELIABILITY.
Technical rept.,
Cyrus Derman, Gerald J. Lieberman, and Sheldon M. Ross. 29 Sep 72, 28p Rept no. TR-151
Contract N00014-67-A-0112-0052

Descriptors: (*Reliability, Optimization), Systems engineering, Random variables, Probability, Algorithms.

The first problem considered in the paper is concerned with the assembly of independent components into parallel systems so as to maximize the expected number of system that perform satisfactorily. Associated with each component is a probability of it performing successfully. It is shown that an optimal assembly is obtained if the reliability of each assembled system can be made equal. If such equality is not attainable, then bounds are given so that the maximum expected number of systems that perform satisfactorily will lie within these stated bounds; the bounds being a function of an arbitrarily chosen assembly. An improvement algorithm is also presented. A second problem treated is concerned with the optimal design of a system. Instead of assembling given units, there is an opportunity to control their quality, i.e., the manufacturer is able to fix the probability, p, of a unit performing successfully. However, his resources are limited so that a constraint is imposed on these probabilities. (Author)

AD-750 740 PC$3.00/MF$0.95
Naval Weapons Quality Assurance Office Washington D C
INFANT MORTALITY SCREENING: A DISCUSSION OF BURN-IN AND OTHER SCREENING TECHNIQUES,
D. H. Markowitz, and R. G. Pouliot. 30 Jun 67, 84p

Descriptors: (*Reliability (Electronics), Reviews), Electronic equipment, Test methods, Failure (Electronics), Semiconductor devices, Integrated circuits, Naval equipment, Statistical analysis.

The report is the product of an extensive literature search on the topic of burn-in combined with visits to manufacturing plants to investigate burn-in in use. Because of the nature of the problem investigated, literature on screening in general came under scrutiny and the investigation was not limited to burn-in alone. The discussion reflects this and is concerned with screening techniques. Articles relevant to the phenomenon of infant mortality and the problem of screening for 'early' failures were collected and abstracted in the last section of the report. (Author)

N72-28464 PC$3.75/MF$0.95
Defence Research Establishment Valcartier (Quebec).
RESOLUTION OF THE MICROWAVE LENS SYSTEM USED IN AN XS-BAND INTERFEROMETER.
A. Fitchett. May 72, 34p DREV-TN-1998/72

Descriptors: *Interferometers, *Superhigh frequencies, Channels, Electron density (concentration), Microwave equipment.

For abstract, see STAR 10 19.

14E. Reprography

AD-750 530 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
EVALUATION OF THE ROLE OF THE OBJECTIVE LENS IN CONTRAST SENSITIVITY OF A VIDICON CAMERA,
K. A. Fedorov. 25 Aug 72, 19p Rept no. FTD-HT-23-1268-72
Edited trans. from Tekhnika Kino i Televideniya (USSR) p47-52 1971, by Charles T. Ostertag, Jr.

Descriptors: (*Camera lenses, Photosensitivity), (*Television cameras, Camera lenses), Focusing, Photographic contrast, Analysis, USSR.
Identifiers: Translations.

An analysis is made of the losses of signal of a vidicon tube which are conditioned by optical losses in the objective lenses of the transmitting camera during the transmission of small objects of various nature (dots, lines group of lines). It is concluded that a significant role in the transmission of small objects is played by the objective lens. The optical losses in the objective depend not only on the dimensions of the small object transmitted, but also on its nature. (Author)

AD-750 580 PC$3.00/MF$0.95
Army Engineer Topographic Labs Fort Belvoir Va
PROTOTYPE LITHOGRAPHIC ENLARGING PROJECTION PLATEMAKER.
Rept. for Nov 71-Feb 72,
Henry Wiener. Aug 72, 42p Rept no. ETL-ETR-72-4

Descriptors: (*Lithography, Map projection), (*Maps, Reproduction), Performance (Engineering), Cooling + ventilating equipment, Power supplies, Control systems.

The report presents the results of the engineer design tests of the prototype lithographic enlargina platemaking equipment. The unit represents for the first time the ability to expose 25 1/2- by 36-inch conventional diazo presensitized lithographic plates directly to miniaturized material, and it therefore reflects a major breakthrough in U.V. optics. The resulting press plates were successfully processed and printed on an offset lithographic press with excellent results. (Author)

AD-750 866 PC$3.00/MF$0.95
Arnold Engineering Development Center Arnold Air Force Station Tenn
OPTICAL INSTRUMENTATION STUDIES IN AEROSPACE FACILITIES - - A PROJECT SUMMARY.
Final rept. Jul 71-Jun 72,
Paul H. Dugger. Oct 72, 43p Rept no. AEDC-TR-72-141
Contract F40600-73-C-0004
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn. Rept. no. ARO-VKF-TR-72-105.

Descriptors: (*Test facilities, Photographic techniques), (*High-speed photography, Hypervelocity projectiles), (*Hypervelocity projectiles, Flow visualization), Ballistic cameras, Lasers, Stereoscopic photography, Hypersonic characteristics, Flow fields.
Identifiers: Holography, Q switched lasers, Ruby lasers.

Evaluations and remedial modifications to laser photography systems have resulted in a 30-percent increase in reliability for optimum performance. Another unique modification to the laser photographic technique has added the capability for flow visualization when desired. A 70-percent increase in spatial resulution has resulted from refinements to photopyrometry systems. Investigations of schlieren-related flow visualization techniques resulted in the selection of a focused shadowgraph arrangement for detection of boundary-layer transition on conical models. Preliminary designs for photographic instrumentation systems for use during erosion testing were completed. (Author)

N72-28363 PC$4.00/MF$0.95
National Research Council of Canada, Ottawa (Ontario).
PHOTOGRAMMETRIC ASPECTS OF PRECISION PROCESSING OF ERTS-A IMAGERY.
V. Kratky. 1971, 36p

Descriptors: *Distortion, *Earth resources technology satellite a, *Imagery, Data processing, Earth rotation, Mapping, Multispectral band scanners, Numerical analysis, Vidicons.

For abstract, see STAR 10 19.

N72-28457 PC$3.25/MF$0.95
California Univ., Riverside. Dept. of Geography.
PHOTOGRAPHIC FILMS AS REMOTE SENSORS FOR MEASURING ALBEDOS OF TERRESTRIAL SURFACES.
Final Report
S. R. Pease, and R. W. Pease. Mar 72, 22p
NASA-CR-127477, USGS-IR-NASA-225
Contract NASA ORDER W-13265,
USGS-14-08-001-11914

Descriptors: *Earth albedo, *Photographic film, *Remote sensors, Aerial photography, Earth surface, Multispectral photography, Performance tests, Radiation absorption, Solar radiation.

For abstract, see STAR 10 19.

N72-28469 PC$4.50/MF$0.95
Arizona Univ., Tucson. Optical Sciences Center.
APOLLO 9 MULTIBAND PHOTOGRAPHY EXPERIMENT S065.
R. A. Schowengerdt, and P. N. Slater. May 72, 46p
NASA-CR-115737, TM-3
Contract NAS9-9333

Descriptors: *Apollo 9 flight, *Calibrating, *Spaceborne photography, Fourier analysis, Imagery, Microdensitometers, Multispectral photography, Signal to noise ratios.

For abstract, see STAR 10 19.

N72-28472 PC$3.00/MF$0.95
Royal Aircraft Establishment, Farnborough (England).
PROPERTIES OF THE PHOTOGRAPHIC EMULSION DURING DISCONTINUOUS EXPOSURE.
A. L. Kartuzhanskii, and P. V. Meiklyar. Jun 72, 19p RAE-LIB-TRANS-1598, BR-29559
Tran- Transl. Into English From Zh. Eksp. Teor. Fiz. (USSR, V. 21, No. 5, 1951 P 598-609

Descriptors: *Photographic emulsions, *Photographic film, *Photosensitivity, Chemical reactions, Light sources, Physical properties.

For abstract, see STAR 10 19.

N72-28474 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AN INVESTIGATION OF PHOTOSENSOR APERTURE SHAPING IN FACSIMILE CAMERAS.
S. J. Katzberg, F. O. Huck, and S. D. Wall. Aug 72, 17p NASA-TN-D-6882, L-8424

Descriptors: *Apertures, *Cameras, *Photoelectricity, *Radiation measuring instruments, Degradation, Imaging techniques, Scanning.

For abstract, see STAR 10 19.

N72-28523 PC$3.00/MF$0.95
Aeronautical Research Labs., Melbourne (Australia).
SOME INITIAL EXPERIMENTS WITH TIME--AVERAGED HOLOGRAPHY TO DETERMINE DYNAMICAL PROPERTIES OF VIBRATING PANELS.
N. B. Joyce, C. M. Bailey, and T. J. Struys. Mar 72, 19p ARL/SM-NOTE-375

Descriptors: *Excitation, *Holography, *Panels, Resonant frequencies, Vibration.

For abstract, see STAR 10 19.

N72-29544 PC$3.00/MF$0.95
Toronto Univ. (Ontario). Inst. for Aerospace Studies.
A COLOUR LASER BEAM IMAGE RECORDER FOR CANADAS REMOTE SENSING PROGRAM.
J. W. Locke. 1972, 7p REPT-1001151

Descriptors: *Color photography, *Lasers, *Recording instruments, *Remote sensors, Canada, Light beams, Scanning, Spaceborne photography.

For abstract, see STAR 10 20.

15. MILITARY SCIENCES

15B. Chemical, Biological, and Radiological Warfare

AD-750 341 PC$3.00/MF$0.95
Edgewood Arsenal Md
A HEAT STABLE, HIGHLY SENSITIVE ENZYME FOR DETECTION AND IDENTIFICATION OF NERVE AGENTS,
David N. Kramer, Harry O. Michel, William Swain, and Ethel Hackley. 1972, 13p

Descriptors: (*Nerve agents, Detection), (*Enzymes, Nerve agents), Identification, Carboxylic ester hydrolases, Bacillus.
Identifiers: Bacillus stearothermophilus.

A heat stable esterase has been isolated from cultures of Bacillus stearothermophilus and characterized with respect to physical and biochemical properties. Its stability up to a temperature of 70C and to high alkalinity is remarkable. Moreover, it is highly useful for the specific identification and detection of G agents as a xlass at extremely low concentrations. Studies are in progress to further purify the enzyme and attempt to determine the utility of the enzyme in a practical detection and identification system.

AD-750 372 PC$3.00/MF$0.95
Edgewood Arsenal Md
LABORATORY RESEARCH ON THE INCINERATION OF MUSTARD,
Samuel Sass, and Paul M. Davis. 1972, 15p

Descriptors: (*Mustard agents, Incinerators), Efficiency, Combustion, Combustion products, Air pollution, Ecology, Odors, Waste gases.

On the basis of laboratory investigations made on two all-glass incinerators operating at 800C (1472F), it was found experimentally that a mustard destruction efficiency of better than 99.9994% can be assured. The level cited for efficiency is limited only by the relatively small amount of mustard burned (up to 13.1 gm/experiment) as reflected in the sensitivity threshold for mustard detection. Air flows tested represented oxygen supply to oxygen demand ratios of 1.13 to 9.94. The 1.13 ratio was sufficient for complete combustion. Experimental residence time of mustard at furnace temperature ranged from 0.14 to 2.22 sec. Scrubber tests under direct absorption conditions showed that sodium hydroxide and sodium bicarbonate allowed collection efficiencies of 99%+ of the hydrogen chloride and 95%+ of the sulfur oxides. Chemical analysis of scrubber salt composition and subjective odor tests versus pH, indicated that absence of odor can be assured from hot salt solution or dry salt, if the scrubber system is maintained above pH 7.5

AD-750 531 PC$11.25/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
CHEMICAL AND BACTERIOLOGICAL (BIOLOGICAL) WEAPONS AND CONSEQUENCES OF THEIR POSSIBLE USE,
A. V. Karpov. 11 Aug 72, 184p Rept no. FTD-MT-24-1945-71
Edited machine trans. of mono. Khimicheskoe i Bakteriologicheskoe (Biologicheskoe) Oruzhie i Posledstviya Ego Vozmozhnogo Primeneniya, Moscow, 1970 156p, by Charles T. Ostertag, Jr.

Descriptors: (*Biological warfare, Effectiveness), (*Chemical warfare, Effectiveness), Ecology, Public health, Control, Defoliants, USSR.
Identifiers: Translations.

In 1969 the General Secretary of the U. N. U Thant presented a report about the consequences of the possible use of chemical and bacteriological weapons. As stated by U Thant, 'The international community does not sufficiently realize the dangers connected with this new form of weapon of mass murder.' The report was prepared by prominent scientists of many countries and in accordance with the resolution of the General Assembly of the U. N. will be published in all states which are members of this organization. (Author)

AD-750 614 PC$3.00/MF$0.95
Army Test and Evaluation Command Aberdeen Proving Ground Md
EXPANDED SERVICE TEST.
Final rept. on test operations procedure.
11 May 72, 26p Rept no. TOP-8-3-110

Descriptors: (*Protective masks, Test methods), Army personnel, Army training, Human engineering, Vision, Mobility, Questionnaires.
Identifiers: Common engineering test procedures.

The report prescribes a method for evaluation of field protective mask operational and functional characteristics. It identifies supporting tests, facilities, and equipment required. It provides procedures for initial inspection, physical characteristics, personnel training, functional suitability, adverse condtions, battlefield mobility, troop acceptability, human factors, and value analysis. Appendices provide controlled field exercise scenario and questionnaire. (Author)

15C. Defense

AD-750 386 PC$3.00/MF$0.95
Army Advanced Ballistic Missile Defense Agency Huntsville Ala
ADVANCED HIGH ENERGY MISSILE CONTROL SYSTEMS,
Larry C. Atha. 1972, 15p

Descriptors: (*Guided missile trajectories, *Thrust vector control systems), (*Antimissile defense systems, Guided missile trajectories), Secondary injection, Liquid jets, Sprays, Flow fields, Interactions.
Identifiers: External burning, Reaction jets.

A new type of control concept which utilizes the interaction of an injected fluid with the airstream surrounding the missile to achieve control forces offers much promise to meet the control requirements for advanced ABM interceptors. Three of these advanced control concepts are described in this paper. They are: external burning, jet interaction, reactive jet interaction. (Author)

AD-750 389 PC$3.00/MF$0.95
Army Advanced Ballistic Missile Defense Agency Huntsville Ala
DATA PROCESSING SYSTEM ANALYSIS,
Charles R. Vick. 1972, 15p

Descriptors: (*Antimissile defense systems, Programming (Computers)), Real time, Data processing systems, Radar tracking, Simulation.

The design, development, and test of real-time software for implementation in a ballistic missile defense data processing system is one of the most challenging undertakings that computer scientists have had to come to grips with. Just as the hardware architects responsible for the super computers of today, which employ gate counts in the millions, have evolved rigid disciplines and employed high degrees of automation to successfully deploy their product, the software architects of the super computers are establishing a software engineering technology. The paper describes a program directed toward identifying and implementing the beginnings of such a technology. Its major goal was to pioneer techniques which would make manageable and offer visibility and confidence in massive real-time software systems such as those required in ballistic missile defense. (Author)

15E. Logistics

AD-750 319 PC$3.00/MF$0.95
Army Tank-Automotive Command Warren Mich
ANALYTICAL PREDICTION OF VEHICLE MOBILITY,
Howard Dugoff, and Adam Rula. 1972, 15p

Descriptors: (*Vehicles, Mobility), (*Armed forces transportation, Mathematical models), Tracked vehicles, Ground effect machines, Trailers, Vehicle chassis components, Mechanical properties, Motor vehicle operators, Classification, Cold weather tests.
Identifiers: *Wheeled vehicles, AMC-71 mobility model, Vehicle terrain interactions.

The document is concerned with the need for an objective analytical procedure for quantitatively assessing the performance of a vehicle in any specified operational environment. In theory, the same methodology can serve the needs of all major practitioners, provided it relates vehicle performance to basic characteristics of the vehicle-driver-terrain system at appropriate levels of detail. (Author)

AD-750 322 PC$3.00/MF$0.95
Army Mobility Equipment Research and Development Center Fort Belvoir Va
DEVELOPMENT OF MULTIPURPOSE WATER UNIT FOR ARMY FIELD USE,
Allen Ford, Jr., and Don C. Lindsten. 1972, 15p

Descriptors: (*Water supplies, Purification), (*Army operations, Water supplies), Membranes, Transport properties, Army research, Osmosis, Pressurization, Mathematical models, Bacteria, Solubility.
Identifiers: Potable water, *Water treatment, Reverse osmosis, Turbidity.

It is essential that the U. S. field Army be provided with potable drinking water for culinary, washing, bathing, laundering, and food preparation purposes. In view of inherent complexities, a single multipurpose unit is needed which is capable of producing potable drinking water from whatever raw water source may be available. A reverse osmosis (RO) process is described which holds promise of satisfying this requirement. (Author)

AD-750 365 PC$3.00/MF$0.95
Army Construction Engineering Research Lab Champaign Ill
A STOCHASTIC NETWORK TO MODEL AIR CARGO TERMINALS,
H. A. Porte, W. W. Happ, C. T. Lee, and L. P. McNamee. 1972, 16p

Descriptors: (*Cargo, *Handling), (*Airports, Cargo), Stochastic processes, Queueing theory, Material control, Warehouses, Mathematical models.
Identifiers: Computerized simulation, Network flows.

In recent years design approaches to aircargo terminal operations had to be reexamined in order to cope with the vast increases in the cargo handling requirements due to the introduction of jumbo jets. Although a new cargo handling system proposed by Dortech would seem to handle the large cargo commitments, virtually no evaluation of its functional capabilities had been verified by actual design or by in depth computer simulation studies. Relevant computer studies include: the simulation of aircargo input/output cargo flow patterns, and the development of a GERTS IIIQ simulation model of a Dortech type aircargo facility. In the paper an in depth parameter study of the Dortech approach to aircargo handling is presented by means of a GERTS IIIQ simulation model. (Author)

AD-750 366 PC$3.00/MF$0.95
Army Tropic Test Center Apo New York 09827
AN INTENSIVE APPROACH TO THE STUDY OF MATERIALS DETERIORATION IN THE TROPICS,
Wilfried H. Portig, George W. Gauger, and George F. Downs. 1972, 13p

Descriptors: (*Tropical deterioration, Army research), Tropical tests, Materials, Logistics.

The purpose of the paper is to report an experiment in tropic material degradation being conducted by the US Army Tropic Test Center. The experiment differs from many other studies of the same phenomenon by emphasizing a higher data rate, expanded geographic coverage and extensive laboratory analyses. This paper covers early results only, representing a fraction of the data that will be available at the conclusion of the study.

AD-750 386 PC$3.00/MF$0.95
Army Construction Engineering Research Lab Champaign Ill
OPTIMIZATION OF RESOURCE ALLOCATION IN MAINTENANCE MANAGEMENT LOGISTICS SYSTEMS,
Robert L. Trent, Elmer C. Martin, and Jack C. Wine, Sr. 1972, 19p

Descriptors: (*Logistics, *Management planning), (*Antimissile defease systems, Logistics), Manpower studies, Scheduling, Maintenance, Spare parts, Inventory control, Management control systems, Data processing systems.
Identifiers: *Manpower studies, Forecasting, Scheduling, Maintenance, Spare parts, Inventory control, Management control systems, Date processing systems.

The report describes the multiphasic development of an integrated logistic suppor system specifically designed to forecast maintenance manpower staffing levels, and supportive resource requirements, and to provide operational scheduling for the maintenance of the Tactical Support Equipment (TSE) associated with the various sites of the SAFEGUARD BMD System. (Author)

AD-750 427 PC$3.00/MF$0.95
George Washington Univ Washington D C Program in Logistics
OPTIMAL ISSUING POLICIES UNDER STOCHASTIC FIELD LIVES,
Mark Brown, and Herbert Solomon. 18 Aug 72, 17p Rept no. Serial-T-270
Contract N00014-67-A-0214-0001

Descriptors: (*Inventory control, Mathematical prediction), Stochastic processes, Random variables, Stock level control, Reliability, Life expectancy, Optimization, Theorems.

Consider a stockpile of n items where the ith item has a rating (r sup i), i = 1,...,n. An item with rating (r sup i) if released to the field at time 0 will have a random field life distributed as x sub (r sub i); X sub (r sub i), i = 1,...,n is a collection of random variables which are increasing in r in the sense of monotone likelihood ratio. An item with rating (r sup i) if kept in stockpile until time t and then released to the field will have a field life distributed as X sub (r sub i)d (t) where d (t) is a nonrandom function. Items are to be issued from the stockpile to the field until the stockpile is depleted. The ith issued item is placed in the field immediately upon the death in the field of the (i-1)st issued item. The problem studied is to find the order of item issue which maximizes in some sense the total field life obtained from the stockpile. (Author)

AD-750 843 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
AN ANALYSIS OF THE FEASIBILITY OF USING CATEGORY II TEST DATA TO IMPROVE PROVISIONING ESTIMATES.
Masters thesis,
Robert L. Jones, and Robert S. Darden. 15 Sep 72, 107p Rept no. SLSR-5-72B

Descriptors: (*Armed Forces supplies, Mathematical prediction), (*Air Force procurement, Spare parts), (*Jet fighters, Spare parts), Air Force budgets, Costs, Management planning, Military requirements, Contracts, Reliability, Regression analysis, Maintenance, Malfunctions, Theses.
Identifiers: Logistics management, *Provisioning, F-15 aircraft, Cost overruns, Cost estimates.

Provisioning estimates under present procedures have been subject to criticism as a result of inaccuracies which have occurred in the provisioning process. Inaccuracies occur as a result of the many unknowns which exist at the time provisioning takes place. The authors of the thesis sought to improve the provisioning process by reducing these unknowns through a systematic analysis of Category 2 data, which is not currently used in the provisioning process. Tabular and graphical presentations of the results are displayed; an analysis is made. Following this analysis, the authors draw conclusions and make their recommendations for improving the provisioning process. (Author)

AD-750 844 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
IMPACT OF ADVANCED LOGISTICS SYSTEM CONCEPTS ON HUMAN AND ORGANIZATIONAL SYSTEMS.
Master's thesis,
Henry J. Hansman, Dae Yul Ro, and Gerald L. Matthews. 15 Sep 72, 204p Rept no. SLSR-8-72B

Descriptors: (*Logistics, *Air force operations), Military organizations, Management engineering, Theses.

The Advanced Logistics System will have a profound impact upon the human and organizational environment of the Air Force logistics system and could lead to eventual centralization of Air Force logistics processes with AFLC assuming many of the logistics decisions now made by the user commands and bases. For the present, the primary effects will be limited to centralization of information and control of only AFLC logistics processes with enhanced AFLC capability to support the USAF mission. ALS is progressing well in its development stage; however, a main problem is the need for better ALS information dissemination to the user commands. (Author)

AD-750 845 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
A STUDY OF THE ALTERNATIVE METHODS OF MEETING THE MILITARY REQUIREMENTS FOR STRATEGIC AIRLIFT IN THE 1970'S.
Master's thesis,
James M. Galyen, and William E. Krebs. 15 Sep 72, 207p Rept no. SLSR-14-72B

Descriptors: (*Air transportation, Advanced planning), (*Department of Defense, *Logistics), Tactical air support, Commercial planes, Armed forces operations, Operational readiness, Cargo, Air drop operations, Costs, Theses.
Identifiers: CRAF (Civilian Reserve Air Fleet), Civilian reserve air fleet, Containerization.

The requirement for a viable strategic airlift capability will become increasingly more important for defense planners in the 1970s and 1980s. The strategy to reduce overseas garrisons and prepositioning of supplies will place a greater burden on strategic airlift to support the Nixon Doctrine of having the capability to engage in one and one-half wars. To compound the problem, the commercial carriers have been very reluctant to purchase the large cargo jets to supplement the Military Airlift Command. Through their research the authors explore possible alternatives for strategic airlift in the ensuing decade. (Author)

AD-750 848 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
AN EVALUATION OF THE COST EFFECTIVENESS OF TRANSPORTING AIR ELIGIBLE CARGO BY AIR VERSUS SURFACE MODES OF TRANSPORTATION.
Master's thesis,
Forrest H. Bennett, Jr., and Charles H. Abel. 15 Sep 72, 102p Rept no. SLSR-26-72B

Descriptors: (*Cargo, Armed Forces transportation), (*Armed Forces transportation, Cost effectiveness), Air transportation, Railroads, Cargo vehicles, Costs, Inventory analysis, Air Force procurement, Air Force budgets, Damage assessment, Theses.
Identifiers: Logistics management.

Transportation priority 1 and 2 air eligible cargo is being moved from the AFCL Air Materiel Areas to CONUS on-line LOGAIR stations by surface modes. An arbitrary limit of one LOGAIR flight per station per day imposed a ceiling on the daily capability of the LOGAIR system. The increased pipeline intransit time resulting from use of the surface modes forces a set level of inventory investment. The procurement of additional LOGAIR capability reduces the overall transportation priority 1 and 2 cargo pipeline intransit time and therefore reduces the inventory investment. The thesis proposes a method to offset the increased costs of procuring additional airlift through a reduction in inventory investment. (Author)

AD-750 849 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
A STUDY OF THE F-15 CONTRACT STRUCTURE AND ITS CONTRIBUTION TO EFFECTIVE PROGRAM MANAGEMENT.
Master's thesis,
Gerald A. Christenson, and James C. Horne. 15 Sep 72, 172p Rept no. SLSR-27-72B

Descriptors: (*Contracts, *Management planning), (*Department of Defense, *Armed forces procurement), Air force procurement, Aircraft industry, Economics, Costs, Cost effectiveness, Value engineering, Theses.
Identifiers: F-15 aircraft, *Contract administration, Fixed price incentive contracts, *Program management, Milestone procurement, Cost plus incentive fees.

Government contracting personnel have had a history of accepting a procurement procedure which appeared to be successful in past program and erroneously applying those same procedures to new and different programs. The F-15 contract contains some new and some uniquely applied standard contract clauses. These clauses were described, analyzed, and presented independently in the thesis. After the independent study of the clauses, a summary of the interrelatedness of these clauses was presented. The author's interpretation of what external factors influenced the F-15 contract and how the F-15 contract philosophy evolved are also presented. The authors have made recommendations which apply to the future use of the F-15 contract clauses. (Author)

AD-750 856 PC$3.00/MF$0.95
Iowa State Univ Ames Engineering Research Inst
THE BASIC DYNAMIC MODEL OF THE AIRLIFT SERVICE INDUSTRIAL FUND OF THE MILITARY AIRLIFT COMMAND.
Final rept.,
C. E. Smith. Jun 71, 102p Rept no. ERI-99940
Contract F44620-69-C-0002
Revision of report dated Aug 70.

Descriptors: (*Air transportation, *Budgets), (*Armed forces transportation, Air transportation), Management planning, Logistics, Scheduling, Costs, Predictions, Mathematical models, Computer programs.
Identifiers: Computerized simulation, Dynamo computer program, Military Airlift Command, IBM 360 computers.

The report describes in detail the model developed of the Military Airlift Command Industrial Fund. This report begins with a description of the Industrial Fund, its objectives and its constraints. The model variables are then identified and their interrelationships described. The modeling technique used is Industrial Dynamics which provided a method for simulating the time varying behavior of the real system. The completed model is provided in the Appendix. It is coded for the Dynamo compiler program for the IBM 360/67 computer. (Author)

AD-750 907 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
THE INTERRELATION OF LOGISTICS COSTS IN MANAGING THE NICKEL CADMIUM BATTERY PROGRAM.
Master's thesis,
Frank R. Bartlett, and Leo J. Brennan. 15 Sep 72, 87p Rept no. SLSR-3-72B

Descriptors: (*Logistics, *Costs), (*Batteries + components, Management planning), Armed Forces budgets, Armed Forces procurement, Decision making, Maintenance, Theses.
Identifiers: Nickel cadmium batteries, Logistics management.

Logistics costs are the summation of all costs associated with the four facets of logistics: procurement, supply, transportation and maintenance. Optimization of one of these logistic facets can result in the suboptimization of total logistics costs. The thesis evaluates the effect of a change in maintenance concept in the management of nickel cadmium batteries. It evaluates logistics costs during two phases of management and projects costs based upon a third management concept. Graphic presentations serve to illustrate the effect of these management changes on total logistics costs. Conclusions are drawn and recommendations made to improve logistics management. (Author)

AD-750 912 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
THE DEVELOPMENT OF PERFORMANCE MEASUREMENT STANDARDS FOR THE USAF BASE LEVEL SUPPLY SYSTEM.
Master's thesis,
Larry N. Wellman, and William H. Neill, Jr. 20 Sep 72, 116p Rept no. SLSR-12-72B

Descriptors: (*Armed Forces supplies, Air Force), (*Logistics, Management planning), Management control systems, Decision making, Systems engineering, Weapon systems, Aircraft, Maintenance, Data processing systems, Costs, Theses.
Identifiers: Logistics management, Integrated logistic support, Management information systems.

The System to Automate Logistics (STALOG) study group has been formed to develop and integrated base level logistics system. This research effort is directed toward evaluating the current status of the supply performance measurement system. The current lack of a standard package of measurement areas for base supply is not conducive to optimal management at base level. The Delphi technique was tested to ascertain its effectiveness in identifying measureable areas to determine effective support to aircraft maintenance. A consensus was obtained on seventeen measureable areas from a panel of maintenance and supply experts. The use of the Delphi technique and its limitations are discussed. (Author)

AD-750 916 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
AN INVESTIGATION INTO THE USE OF COMPUTER MODELS DURING CONCEPTUAL PHASE LOGISTICS PLANNING.
Master's thesis,
Joseph P. LaBelle, and Robert F. Turner. Sep 72, 143p Rept no. SLSR-23-72B

Descriptors: (*Logistics, Management planning), Mathematical models, Programming (Computers), Costs, Life cycle, Systems engineering, Electronic equipment, Maintenance, Theses.
Identifiers: Integrated logistics support, Computerized simulation, Logistics management.

Integrated Logistics Support (ILS) policy and guidance within the DOD and the Air Force refer to a relatively sophisticated process of quantitative analysis as being essential to logistics support planning during all phases of the system acquisition life cycle. The feasibility and practicality of using computer programmed simulation and analytical models during conceptual phase ILS planning are examined with emphasis on Air Force electronic system acquisition programs. Five existing logistics models are evaluated for compatibility with the quantitative requirements and availability of source data within the conceptual phase ILS planning environment. Conclusions and suggested prerequisites for implementation are presented. (Author)

AD-750 919 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
A STUDY TO DETERMINE IF DESIGN AND BUILD PROCUREMENT METHODS FOR MILI-

TARY FAMILY HOUSING ARE MORE ECONOMICAL THAN CONVENTIONAL OR TWO STEP METHODS.
Master's thesis,
George D. Smith, and Daniel A. Krausse. 15 Sep 72, 61p Rept no. SLSR-28-72B

Descriptors: (*Armed Forces procurement, Housing), (*Housing, Military requirements), Contracts, Costs, Construction, Regression analysis, Theses.
Identifiers: Turnkey housing concept.

Until the late 1960s, all military family housing was procured under the conventional method. The Air Force then began using the two step procurement method. At about the same time the Navy began using a design and build method called 'Turnkey.' The study tests tow hypotheses: (1) Turnkey is less costly than the other methods and (2) Turnkey is faster than the other methods. For forty-seven projects built primarily in Fiscal Years 1970 and 1971 it was found that the Two Step and the Conventional methods are statistically significantly cheaper than the Turnkey method. There was no statistically significant difference in the time required to complete a project among the three methods. (Author)

AD-750 920 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
THE FEASIBILITY OF ESTABLISHING 'SHOULD COST' AS A PERMANENT AIR FORCE CONTRACT MANAGEMENT DIVISION/AIR FORCE PROCUREMENT FUNCTION.
Master's thesis,
Ralph E. Weida, and George M. Sloan. 20 Sep 72, 153p Rept no. SLSR-31-72B

Descriptors: (*Air Force procurement, *Costs), Department of Defense, Contracts, Management planning, Decision making, Cost effectiveness, Theses.
Identifiers: Cost overruns, Cost analysis, Cost estimates, Should cost action program, SCAP (Should Cost Action Program).

The defense procurement environment has changed significantly during the past several years due to public and congressional criticism regarding large overruns and cost growth. In this respect the Air Force is experimenting with a specialized application of cost analysis called the 'should cost' concept. The feasible location of a permanent application of the concept was examined--the AFCMD/AFPRO organization. The desirability of establishing an on-going capability in the AFCMD/AFPRO setting was concluded contingent upon the continued top level management's support of the concept. In addition, manpower increases and training programs would be needed to make the permanent application feasible and desirable. (Author)

AD-750 922 PC$4.85/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
AN EVALUATION OF DEPARTMENT OF DEFENSE POLICIES FOR SUBCONTRACTOR QUALITY CONTROL.
Master's thesis,
Jerome C. Dondlinger. Sep 72, 78p* Rept no. SLSR-34-72B

Descriptors: (*Government procurement, Efficiency), (*Contracts, Quality control), Department of Defense, Armed Forces procurement, Military requirements, Management planning, Theses.
Identifiers: Subcontracting, Subcontractor quality control, Logistics management, Contract administration.

During the current period of time when emphasis within DoD procurement is on efficiency, subcontractor quality control procedures are being considered as a possible means of improvement. The document explores possible means of improving the efficiency of subcontractor quality control procedures on Government contracts. Through extensive questionnaire techniques, expert opinions of knowledgeable quality control personnel have been gathered and evaluated. Suggested ASPR changes are presented as a possible means of increasing the efficiency and effectiveness of subcontractor quality control. (Author)

AD-750 923 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
THE CREATE (COMPUTATIONAL RESOURCES FOR ENGINEERING AND SIMULATION, TRAINING, AND EDUCATION) VERSION OF GERTS IIIZ (GRAPHICAL EVALUATION AND REVIEW TECHNIQUE 3Z).
Master's thesis,
Gary L. Graves, and Shirley A. Roy. 20 Sep 72, 115p Rept no. SLSR-35-72B

Descriptors: (*Logistics, Networks), Mathematical models, Stochastic processes, Management control systems, Reliability, Systems engineering, Graphics, Programming (Computers), Theses.
Identifiers: Network analysis theory, Network flows, Graph theory, Computerized simulation, GERTS (Graphical Evaluation and Review Technique Simulator), Graphical evaluation and review technique simulator.

The GERTS (Graphical Evaluation and Review Technique) simulation package designated GERTS IIIZ was implemented on the CREATE (Computational Resources for Engineering and Simulation, Training, and Education) system currently operating on the General Electric Model 600 computer located at Wright-Patterson AFB, Ohio. A users' manual illustrating GERTS features was prepared by describing the GERTS network characteristics and overall program operation, defining the necessary inputs to the program, and developing and processing sample problems. The sample problems included both conceptual and systems reliability networks. Included with each sample problem were the procedures used in preparing the input and illustrations of the computer output. (Author)

15F. Nuclear Warfare

AD-750 721 PC$3.00/MF$0.95
Hudson Inst Inc Croton-on-Hudson N Y
AN ANALYSIS OF 'ASSURED DESTRUCTION'.
Research rept.,
Edward S. Boylan, Donald G. Brennan, and Herman Kahn. 20 Mar 72, 28p Rept no. HI-1602-RR
Contract DAC15-71-C-0206
See also report dated 20 Mar 72, AD-750 722.

Descriptors: (*Nuclear warfare, Reviews), Antimissile defense systems, Deterrence, Disarmament, Foreign policy, USSR, Mass destruction weapons, Deployment, Countermeasures.
Identifiers: *Assured destruction, First strike capability.

The belief that the United States must retain an 'assured destruction' capability, to be able to destroy some fixed percentage of Soviet citizenry and industrial capacity, even after absorbing a Soviet nuclear first strike, is the cornerstone of American strategic policy, both at present and in the mid-to-late 1960's. Arguments for and against the desirability of basing U.S. strategic policy upon retention of an assured destruction capability are given. A large number of quotations are given from proponents and opponents. (Author)

AD-750 722 PC$3.00/MF$0.95
Hudson Inst Inc Croton-on-Hudson N Y
ALTERNATIVES TO ASSURED DESTRUCTION.
Research rept.,
Edward S. Boylan, Donald G. Brennan, and Herman Kahn. 20 Mar 72, 41p Rept no. HI-1603-RR
Contract DAHC15-71-C-0206
See also report dated 20 Mar 72, AD-750 721.

Descriptors: (*Nuclear warfare, Reviews), Antimissile defense systems, Deterrence, Disarmament, Foreign policy, USSR, Mass destruction weapons, Deployment, Countermeasures.
Identifiers: *Assured destruction, First strike capability.

A previous paper, 'An Analysis of Assured Destruction', presented arguments for and against basing U.S. strategic policy upon retention of an assured destruction capability. This paper presents a number of alternative strategic postures and presents the arguments for and against each of them. As in the earlier paper, a large number of quotations from relevant sources are given. (Author)

15G. Operations, Strategy, and Tactics

AD-750 303 PC$3.00/MF$0.95
Bundesminister Der Verteidigung Bonn (West Germany) Wehrtechnik
RESEARCH AND DEVELOPMENT GOALS OF THE GERMAN ARMY.
1972, 11p

Descriptors: (*Armed Forces operations, West Germany), Advanced planning, Close support, Artillery rockets, Tanks (Combat vehicles), Antitank ammunition, Fire control systems, Antiaircraft defense systems, Aerial reconnaissance.

Combat readiness capabilities and technological requirements for future combat defense are discussed in the report.

AD-750 348 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
MAPPING SEISMIC RESPONSE CHARACTERISTICS OF COMPLEX TERRAIN,
Lewis E. Link, Jr., and William F. Marcuson, III. 1972, 15p

Descriptors: (*Microseisms, Detection), (*Warning systems, Seismometers), Seismology, Terrain, Feasibility studies, Sensors, Sensitivity.
Identifiers: Seismic intrusion detectors.

For the past 18 months the Waterways Experiment Station (WES) has been actively engaged in the development of technology and procedures for the production of intelligence products for the use of seismic intrusion detection devices. These devices detect the presence of an intruder (man or vehicle) by the seismic energy generated in the earth by the intruder. The paper defines the problem areas involved, describes the WES approach for solution of the problem, and outlines the status of the work being conducted at the WES. (Author)

AD-750 705 PC$3.00/MF$0.95
AAI Corp Baltimore Md
SYSTEMS FOR RAPID PREPARATION OF AIRDROP LOADS.
Technical rept.,
W. L. Black, and A. L. Farinacci. Jul 72, 152p
USA-NLABS-TR-72-79-AD
Contract DAAG17-70-C-0174

Descriptors: (*Air drop operations, Feasibility studies), Parachute descents, Cargo parachutes, Drag parachutes, Retro rockets, Containers, Nonpowered flight, Soft landings, Pallets, Detents, Time studies, Costs.
Identifiers: Evaluation.

A study was conducted to develop new concepts and procedures for the airdrop of supplies and equipment which would significantly reduce the time and labor required to prepare airdrop loads for airdrop and retrieve them after the drop. A goal of equal importance is the reduction of airdrop malfunctions caused by improper rigging. Study of current rigging designs and procedures identified the tasks that were the most time consuming and the operations that contributed the higher rates of malfunctions. Thirty-two (32) concepts for equipment and procedures were developed which were judged to have sufficient merit to warrant consideration in the search for a system solution. (Author)

AD-750 925 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
SOME VIEWS OF THE GREAT POWERS ON THE TACTICAL USE OF AIR POWER IN A FUTURE WAR,
E. Cemalovic. 25 Aug 72, 16p Rept no. FTD-HC-23-0627-72
Unedited rough draft trans. of Vazduhoplovni Glasnik (Yugoslavia) v17 n1 p3-11 1960.

Descriptors: (*Tactical warfare, Predictions), War potential, Nuclear warfare, Biological warfare, Chemical warfare, Ordnance, Tactical air support, Naval operations, Close support, Deployment, Mission profiles, Yugoslavia.
Identifiers: Major military powers, Translations.

The article contains the author's views on the tactical use of air forces by the great powers in a future war. (Author)

16. MISSILE TECHNOLOGY

16A. Missile Launching and Ground Support

AD-750 944 PC$3.00/MF$0.95
Federal Electric Corp Vandenberg AFB Calif
SPACE AND MISSILE TEST CENTER LAND-BASED INSTRUMENTATION HANDBOOK.
Apr 72, 252p SAMTEC-TR-72-3
Contract F04701-72-C-0102
Supersedes AD-875 364.

Descriptors: (*Guided missile ranges, Instrumentation), (*Instrumentation, *Handbooks), Guided missile tracking systems, Telemeter systems, Launching sites, Radar equipment, Radar tracking, Optical tracking, Impact prediction, Data transmission systems, California, Hawaii.
Identifiers: Vandenburg Air Force Base, Pillar Point Air Force Station, Anderson Peak, Santa Ynez Peak, Phoenix Islands.

The Space and Missile Test Center (SAMTEC) landbased instrumentation provides launch support capabilities for purposes of range safety, ballistic missile impact prediction and location, telemetry data acquisition and reduction, and satellite tracking and communications. Installed systems and equipments are used to support missile and space programs originating at Vandenberg AFB, Calif. as well as operational programs originating at other service and national ranges. Principal SAMTEC instrumentation facilities and operational support systems are located in California, Hawaii and downrange sites in the Pacific Ocean Area. (Author)

16C. Missile Warheads and Fuses

AD-750 336 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
RESPONSE OF CYLINDRICAL SHELLS TO TRAVELING LOAD SIMULATION OF X-RAY BLOW-OFF IMPULSE,
Norris J. Huffington, Jr., and John D. Wortman. 1972, 11p

Descriptors: (*Reentry vehicles, *Nuclear radiation), (*Nuclear explosions, Reentry vehicles), Cylindrical bodies, Simulation, Blast, Loading (Mechanics), Deformation, Response, Predictions.
Identifiers: Finite difference theory, Cylindrical shells, Impulse loading, Computer aided analysis.

A procedure widely used to simulate blow-off impulse loading of shell structures (e.g., reentry vehicles or interveptor missiles) is to apply layers or strips of sheet explosive to the outside surface of the structure, usually separated from this surface by a thin attenuator layer of soft material to prevent spallation from the inner surface. Since this sheet explosive cannot be detonated simultaneously, but is initiated as a plane or curved detonation front sweeping over the structure, some concern has been felt as to whether this procedure will produce the same structural response as the simultaneously applied X-ray loading which it is intended to simulate. A study was conducted in which the responses of fixed-ended cylinders to a frontal cosine distribution of impulse intensity were calculated for three cases: a load pulse initiated simultaneously on the entire frontal half of a cylinder, a plane detonation front sweeping longitudinally and a plane detonation front sweeping circumferentially. (Author)

16D. Missiles

N72-30917 PC$3.00/MF$0.95
Cincinnati Univ., Ohio.
DYNAMIC CHARACTERISTICS OF A TWO--STAGE VARIABLE-MASS FLEXIBLE MISSILE WITH INTERNAL FLOW.
L. Meirovitch, and J. Bankovskis. Jun 72, 138p
NASA-CR-2076
Contract NGR-36-004-030

Descriptors: *Aeroelasticity, *Dynamic structural analysis, *Missile structures, *Residual stress, Flexible bodies, Internal combustion engines, Thrust loads, Transient response, Variable mass systems.

For abstract, see STAR 10 21.

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

AD-750 666 PC$3.00/MF$0.95
Naval Research Lab Washington D C
PROPOSAL FOR A DEEP-SEA SYSTEM FOR EVALUATING ACOUSTIC TRANSDUCERS (DEEPSEAT).
Memorandum rept.,
A. Z. Robinson, R. J. Bobber, and C. L. Buchanan. 1 Sep 72, 38p Rept no. NRL-MR-2514

Descriptors: (*Sonar equipment, Transducers), Test methods, Calibration, Hydrostatic tests, Deep submergence, Peformance (Engineering).
Identifiers: DEEPSEAT (DEEPsea System for Evaluating Acoustic Transducers), Deepsea system for evaluating acoustic transducers, Minicomputers, Evaluation.

A program for solving the problem of evaluating transducers at elevated hydrostatic pressure when existing facilities are not adequate for that purpose is proposed. The program would develop a calibration platform to be lowered to the required depth in the deep ocean. The calibration experiments would be controlled from the ocean surface by means of a hardwire telemetry link. Measurement data would be telemetered back to the surface by the same link for processing and interpretation. Emphasis is placed upon the use of a minicomputer for control of the measurement procedures and for processing and display of the results. (Author)

AD-750 755 PC$3.00/MF$0.95
Saclant ASW Research Centre La Spezia (Italy)
RESOLUTION LIMITATIONS OF A RANDOM INHOMOGENEOUS MEDIUM.
Technical rept.,
Jens M. Hovem. 1 Sep 72, 25p Rept no. SACLANTCEN-TR-214
NATO furnished.

Descriptors: (*Sonar targets, Resolution), Sound transmission, Underwater sound, Doppler effect, Information theory, Transfer functions.
Identifiers: Ambiguity functions, Fourier transformation, Signal processing.

Signals transmitted through a random and inhomogeneous medium will suffer from wavefront distortion and from time and frequency dispersion. This will generally impair the resolution with which target position and doppler can be determined. Treating the resolution properties by means of ambiguity functions, the effects on range, angle and doppler resolution of a particular simple type of random medium are considered. The effect of time and frequency dispersion on the range-doppler ambiguity function is first reviewed. The effects that a random and spatially-dependent medium can have on range and angle resolution is discussed. (Author)

17B. Communication

AD-750 321 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
A THREE-FREQUENCY HETERODYNE DETECTION LASER COMMUNICATIONS SYSTEM FOR ARMY TACTICAL APPLICATIONS,
Larry U. Dworkin, and Jack E. Zavin. 1972, 14p

Descriptors: (*Light communication systems, Performance (Engineering)), Irasers, Atmospheric motion, Optical properties, Mathematical models, Experimental design, Army operations, Tactical warfare, Gas lasers.
Identifiers: Carbon dioxide lasers.

The carbon dioxide laser represents an excellent transmitter for long range wide bandwidth tactical laser communications systems because of its high efficiency, air-cooled, long lifetime stable operation. In addition, it is well within the state-of-the-art of modulators and detectors to fabricate semi-tactical carbon dioxide laser communications system using conventional techniques. The use of the two frequency approach has been shown to be identical to direct detection but possesses the advantages of the heterodyne configuration and thus offers an interesting alternative to present systems for short paths. The current investigation indicates that the three frequency approach presents an attractive trade-off by allowing a small loss in signal-to-noise margin for a large gain in system simplification.

AD-750 630 PC$3.00/MF$0.95
Wilcox Electric Co Inc Kansas City Mo
DEVELOPMENT OF VHF 8-WATT TRANSMITTER TYPE TV-35.
Final rept.,
J. E. Lee. Jul 72, 74p FAA-RD-FAA-RD
Contract FA64WA-5250

Descriptors: (*Radio transmitters, *Air traffic control systems), Very high frequency, Airport control towers, Amplitude modulation, Surface-to-air.

The report describes the design, development, and testing of a VHF ground-to-air radio transmitter for the Federal Aviation Administration. The transmitter is intended for remote operation at airport traffic control towers. It produces a vhf carrier that is amplitude-modulated by an external audio signal. The transmitter contains a crystal oscillator with one crystal pretuned to 121.9 MHz, frequency multipliers, a power amplifier, and a self-contained power supply and low-level modulator. Secondary circuits include a multimeter for tuneup and monitoring, and automatic protective circuits for the power amplifier stage. (Author)

AD-750 650 PC$3.00/MF$0.95
Naval Submarine Medical Research Lab Groton Conn
RESPONSE VARIATIONS OF THREE TYPES OF MICROPHONES PRESSURIZED TO 19 ATA.
Interim rept. no. 8,
Thomas Murry, and Russell L. Sergeant. 3 Dec 71, 17p Rept no. NSMRL-690

Descriptors: (*Microphones, Response), (*Underwater communication systems, Helium), Speech, Intelligibility, Voice communication systems, Oxygen, Pressure.
Identifiers: Speech unscramblers, Helium speech.

The purpose of the study was to determine what changes three types of microphones undergo during compression and decompression to 19 ATA (equiv. to 600 feet of sea water), using a mixture of helium and oxygen. A reciprocity calibrated ceramic microphone was used as the standard for observing the changes of a cardioid (ribbon) type condenser microphone. The results indicate that sensitivity of all microphones decreases as ambient pressure increases. In addition, there are substantial changes in the linearity of the transducers especially at frequencies above 3000 Hertz. The ceramic microphone demonstrated the most consistent responses during descent and ascent. At 17 hours post-dive, it also showed a frequency response that was within one dB of the pre-dive values at all frequencies tested. From this investigation, it would appear that none of the three types of microphones is ideally suited for speech communication in helium-oxygen environments due to the roll off in sensitivity at the high frequencies at depths greater than 200 feet. (Author)

AD-750 828 PC$3.00/MF$0.95
National Aviation Facilities Experimental Center Atlantic City N J
TRANSCRIBED PILOT REPORT (PIREP) BROADCAST SYSTEM, TEST AND EVALUATION.
Final rept. Jan 71-Jul 72,
James G. Dong. Oct 72, 27p Rept no. FAA-NA-72-62 FAA-RD-72-97

Descriptors: (*Weather communications, Recording systems), Data transmission systems, Power supplies, Wiring diagrams, Power amplifiers, Performance (Engineering), Aviation safety.

The report presents results of an automatic transcribed pilot report (PIREP) system fabricated at the National Aviation Facilities EXPERIMENTAL Center (NAFEC). The system used an off-the-shelf endless loop tape recorder which was integrated in the Flight Service Station/Very High Frequency Omnirange configuration at selected sites. Live operational tests were accomplished to determine equipment deficiencies and operational suitability for consideration of expanding the PIREP concepts to other sites. From the operational tests, the concept was not adopted because of pilot apathy to transmitting PIREPS.

N72-28159 PC$6.00/MF$0.95
Ohio State Univ., Columbus. Electroscience Lab.
THE PREDICTION OF MILLIMETER WAVELENGTH PRECIPITATION ATTENUATION USING A CYLINDRICAL STORM CELL MODEL.
L. R. Zintsmaster, and D. B. Hodge. Jun 72, 78p NASA-CR-122445, TR-2374-10
Contract NGR-36-008-080

Descriptors: *Atmospheric moisture, *Data links, *Prediction analysis techniques, *Radio attenuation, *Spacecraft communication, Ground-air-ground communications, Microwave attenuation, Precipitation (meteorology).

For abstract, see STAR 10 19.

N72-28160 PC$3.25/MF$0.95
Virginia Polytechnic Inst., Blacksburg.
POLARIZATION EFFECTS IN MILLIMETER WAVE PROPAGATION THROUGH RAIN A REVIEW OF PRESENT THEORY AND A DISCUSSION OF CURRENT EXPERIMENTS.
P. H. Wiley, C. W. Bostian, W. L. Stutzman, and R. E. Marshall. 19 Apr 72, 21p NASA-CR-122503
Contract NGR-47-004-091

Descriptors: *Depolarization, *Millimeter waves, *Rain, *Telecommunication, *Wave propagation, Graphs (charts), Radio transmission, Tables (data), Wind effects.

For abstract, see STAR 10 19.

PAT-APPL-266822 PC$5.50/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
METHOD AND APPARATUS FOR SYNCHRONIZING A SINGLE CHANNEL DIGITAL COMMUNICATIONS SYSTEM.
Patent Application
L. A. Couvillon, Jr., C. Carl, R. M. Goldstein, E. C. Posner, and R. R. Green. Filed 27 Jun 72, 70p
NASA-CASE-NPO-11302-2
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Data correlation, *Pulse code modulation, *Signal stabilization, *Synchronizers, Coding, Digital techniques, Patent applications, Pulse communication.

A method and apparatus for synchronizing a received PCM communications signal without requiring a separate synchronizing channel is reported. The technique provides digital correlation of the received signal with a reference signal, first with its unmodulated subcarrier and then with a bit sync (PN) code modulated subcarrier, where the code sequence length is equal in duration to each data bit.

PAT-APPL-274360 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
PULSE CODE MODULATED SIGNAL SYNCHRONIZER.
Patent Application
H. S. Kobayshi. Filed 24 Jul 72, 27p
NASA-CASE-MSC-12462-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Bit synchronization, *Pulse code modulation, Circuits, Patent applications, Signal transmission.

A bit synchronizer is described for a split phase PCM transmission, including three loop circuits which receive incoming phase coded PCM signals. In the first loop, called a Q-loop, a generated, phase coded, PCM signal is multiplied with the incoming signals, and the frequency and phase of the generated signal are nulled to that of the incoming signal. In the second loop, called a B-loop, a circuit multiplies a generated carrier signal with incoming signals to null the phase of the generated signal in a phase locked relationship to the incoming signal. In a third loop, called the I-loop, a phase coded PCM signal is multiplied with the incoming signals for decoding the bit information from the PCM signal.

PAT-APPL-266912 PC$3.25/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
GATED COMPRESSOR, DISTORTIONLESS SIGNAL LIMITER.
Patent Application
R. C. Woodbury. Filed 28 Jun 72, 23p
NASA-CASE-NPO-11820-1
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Compressors, *Gates (circuits), Channels, Patent applications, Signal processing.

A distortionless gated compressor for limiting the amplitude of a signal so as not to produce undesired signal levels responsive thereto is disclosed. The gated compressor includes a distortionless multiplier which multiplies an AC signal from a factor defined by a DC control signal. The compressor includes a plurality of channels each responsive to a signal produced in response to the multiplier's output. As long as the signal, supplied to any channel, does not exceed a selected level for the particular signal, the output of a multi-input OR gate is constant.

N72-28178 PC$3.50/MF$0.95
Forschungsinstitut Fuer Funk Und Mathematik, Werthoven (West Germany).
SYNCHRONIZATION OF ERROR DETECTION IN RADAR DATA TRANSMISSION . SYNCHRONISIERUNG UN FEHLERERKENNUNG BEI DER RADAR--DATENUEBERTRAGUNG.
E. Hanle. Feb 70, 29p REPT-142
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Bit synchronization, *Data transmission, *Error detection codes, *Pseudorandom sequences, *Radar data, Communication cables, Modems, Parity, Radar tracking, Telephony.

For abstract, see STAR 10 19.

N72-28231 PC$11.25/MF$0.95
Magnavox Co., Silver Spring, Md. Government and Industrial Div.
A PSEUDO-NOISE TRANSPONDER DESIGN FOR LOW DATA RATE USERS OF THE TRACKING AND DATA RELAY SATELLITE SYSTEM.
Final Report
J. N. Birch. 2 Dec 71, 183p NASA-CR-122500, ASAO-PR20026-4
Contract NAS5-20209

Descriptors: *Electronic equipment, *Space communication, *Tdr satellites, *Transponders, Antenna radiation patterns, Data transmission, Equipment specifications.

For abstract, see STAR 10 19.

N72-28232 PC$3.50/MF$0.95
General Electric Co., Syracuse, N.Y. Electronics Lab.
ELECTRONIC SCENE GENERATOR EXPANSION SYSTEM.
Final Report
W. H. Sharp. Dec 71, 26p NASA-CR-115743
Contract NAS9-11065

Descriptors: *Computerized simulation, *Electronic equipment, *Generators, Aerospace environments, Computer programs, Systems engineering.

For abstract, see STAR 10 19.

N72-28587 PC$17.25/MF$0.95
Toulouse Univ. (France).
CONTRIBUTION TO THE STUDY OF HIERARCHICAL COMMAND STRUCTURES WITH A VIEW TO THE OPTIMIZATION OF COMPLEX PROCESSES . CONTRIBUTION A LETUDE DES STRUCTURES DE COMMANDE HIERARCHISEES EN VUEDE LOPTIMISATION DES PROCESSES COMPLEXES.
Ph.D. Thesis
A. Titli. 19 Jun 72, 305p

Descriptors: *Command and control, *Hierarchies, *Optimization, Constraints, Optimal control.

For abstract, see STAR 10 19.

N72-29162 PC$10.25/MF$0.95
TRW Systems Group, Redondo Beach, Calif.
DEVELOPMENT OF SPECTRAL ANALYSIS MATH MODELS AND SOFTWARE PROGRAM AND SPECTRAL ANALYZER, DIGITAL CONVERTER INTERFACE EQUIPMENT DESIGN.
Final Report
W. L. Hayden, and L. H. Robinson. 16 Jun 72, 164p NASA-CR-115711, TRW-20817-H012-R0-00
Contract NAS9-11977

Descriptors: *Data acquisition, *Data systems, *Digital computers, *Power spectra, *Telecommunication, Data systems, Frequency modulation, Hardware, Mathematical models, Spectrum analysis.

For abstract, see STAR 10 20.

N72-29214 PC$5.00/MF$0.95
Teledyne ADCOM, Cambridge, Mass.
SIMULATION OF THE TDRS MULTIPATH ENVIRONMENT.
Multipath Signal Model Development
E. J. Baghdady, A. F. Ghais, and R. H. Wachsman. Dec 70, 57p NASA-CR-122508, TM-G-161-10
Contract NAS5-10797

Descriptors: *Communication satellites, *Radio communication, *Wave propagation, Doppler effect, Multipath transmission, Signal fading, Simulation.

For abstract, see STAR 10 20.

N72-29684 PC$3.00/MF$0.95
Office National Detudes Et de Recherches Aerospatiales, Paris (France).
PULSE SHAPES AND DISTORTIONS IN MISMATCHED SECOND HARMONIC GENERATION.
J. Thomas, and J. Taran. 1972, 12p
ONERA-TP-1066

Descriptors: *Distortion, *Harmonic generations, *Optical communication, *Pulse communication, *Waveforms, Group velocity, Numerical analysis, Partial differential equations, Phase velocity.

For abstract, see STAR 10 20.

N72-30139 PC$3.75/MF$0.95
Ohio State Univ., Columbus. Electroscience Lab.
MILLIMETER-WAVELENGTHS PROPAGATION STUDIES.
Semiannual Status Report, Nov. 1971 - Apr. 1972
D. B. Hodge, and L. R. Zintsmaster. May 72, 35p NASA-CR-122452, SASR-2374-9
Contract NGR-36-008-080

Descriptors: *Data links, *Meteorological parameters, *Millimeter waves, *Spacecraft communication, Ats 5, Communication satellites, Ground-air-ground communications, Wave propagation.

For abstract, see STAR 10 21.

N72-30141 PC$8.75/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
EARTH-SATELLITE PROPAGATION ABOVE GHZ PAPERS FROM THE 1972 SPRING URSI SESSION ON EXPERIMENTS UTILIZING THE ATS-5 SATELLITE.
L. J. Ippolito. May 72, 131p NASA-TM-X-65990, X-751-72-208
Conf- Conf. Held At Washington, D. C., Apr. 1972

Descriptors: *Ats 5, *Conferences, *Millimeter waves, *Spacecraft communication, *Wave propagation, Atmospheric attenuation, Data acquisition, Meteorology, Radiometers.

For abstract, see STAR 10 21.

N72-30142 PC$3.00/MF$0.95
New Mexico State Univ., University Park. Engineering Environment Station.
ADVANCED STUDY OF VIDEO SIGNAL PROCESSING IN LOW SIGNAL TO NOISE ENVIRONMENTS.
Semiannual Progress Report, Jun. - Nov. 1971
F. Garden, and A. Gilbert. Nov 71, 18p
NASA-CR-115769
Contract NGR-32-003-037

Descriptors: *Apollo project, *Mathematical models, *Space communication, *Television systems, Signal processing, Signal to noise ratios, Spectrum analysis, Telemetry.

For abstract, see STAR 10 21.

N72-30145 PC$13.00/MF$0.95
Radio Corp. of America, Camden, N.J. Government Communications Systems.
MULTI-EVA COMMUNICATIONS SYSTEM ANALYSIS.
Final Report
30 Jun 72, 216p NASA-CR-115766
Contract NAS9-12092

Descriptors: *Data links, *Multichannel communication, *Space communication, *Space shuttles, Cost estimates, Pulse amplitude modulation, Pulse code modulation, Superhigh frequencies.

For abstract, see STAR 10 21.

N72-30148 PC$10.50/MF$0.95
Systems Associates, Inc., Long Beach, Calif.
ADVANCED COMMUNICATION SYSTEM TIME DOMAIN MODELING TECHNIQUES ASYSTD SOFTWARE DESCRIPTION. VOLUME 1 PROGRAM USERS GUIDE.
Aug 72, 168p NASA-CR-128516, R72-001-VOL-1
Contract NAS9-11743

Descriptors: *Computerized simulation, *Manuals, *Telecommunication, Computer programs, Fortran, Time dependence.

For abstract, see STAR 10 21.

N72-30149 PC$5.50/MF$0.95
Systems Associates, Inc., Long Beach, Calif.
ADVANCED COMMUNICATION SYSTEM TIME DOMAIN MODELING TECHNIQUES ASYSTD SOFTWARE DESCRIPTION. VOLUME 2 PROGRAM SUPPORT DOCUMENTATION.
Aug 72, 70p NASA-CR-128517, R72-001-VOL-2
Contract NAS9-11743

Descriptors: *Computerized simulation, *Documentation, *Telecommunication, Computer programs, Fortran, Mathematical models, Time dependence.

For abstract, see STAR 10 21.

N72-30150 PC$4.00/MF$0.95
Hughes Aircraft Co., Culver City, Calif.
COMMUNICATIONS TERMINAL BREADBOARD.
Final Report
Jul 72, 37p NASA-CR-128515
Contract NAS9-12019

Descriptors: *Intelsat satellites, *Pulse communication, *Spacecraft communication, *Systems engineering, Communication equipment, Manned spacecraft, Performance, Satellite networks.

For abstract, see STAR 10 21.

N72-30199 PC$3.00/MF$0.95
Texas A+m Univ., College Station. Inst. for Solid-state Electronics.
ANALYSIS OF SIGNAL TO NOISE ENHANCEMENT USING A HIGHLY SELECTIVE MODULATION TRACKING FILTER.
Final Report
C. R. Haden, and C. W. Alworth. 1 Jun 72, 17p
NASA-CR-115764
Contracts NAS9-9285, PROJ. 1177-32

Descriptors: *Dielectric properties, *Radio communication, *Superconductivity, Photoelectricity, Signal to noise ratios.

For abstract, see STAR 10 21.

N72-30446 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MEASUREMENTS OF SPEED OF RESPONSE OF HIGH-SPEED VISIBLE AND IR OPTICAL DETECTORS.
H. E. Rowe, and J. S. Osmundson. Aug 72, 14p
NASA-TN-D-6874, G-1074

Descriptors: *Laser mode locking, *Laser outputs, *Optical equipment, *Time response, *Yag lasers, Infrared detectors, Optical communication.

For abstract, see STAR 10 21.

PB-212 692 PC$3.00/MF$0.95
Maryland Univ., College Park. Dept. of Electrical Engineering.
OPTICAL COMMUNICATION SYSTEMS,
Robert O. Harger, and John R. Whinnery. 28 Jan 72, 42p
Grant NSF-GK-32172
Report of a Workshop held at Maryland Univ., College Park, January 27-28, 1972.

Descriptors: (*Lasers, *Optical communication), Communication theory, Quantum theory, Atmospheric attenuation, Modems, Optical equipment, Holography, Space communication, Meetings.
Identifiers: Holographic information storage.

The purpose of this workshop is to define research areas where universities may make contributions to the communication system possibilities of the laser. The laser, with its efficiency, fidelity, capacity, and spectrum availability is the highlight of optical communications and engineering optics. Guidelines for NSF grant subjects were tentatively established. Problem areas that presently limit the laser's usage include: Quantum communication theory, turbulent atmospheric channel, materials, broad bandwidth modulators and detectors, auxiliaries. Also discussed was the novel aspects of optical communication systems that theory must examine to correctly determine fundamental limitations with respect to quantum and spatial phenomena. (Author)

17E. Infrared and Ultraviolet Detection

AD-750 377 PC$3.00/MF$0.95
Army Natick Labs Mass

SPECTROSCOPIC STUDIES OF LUMINESCENCE EMITTED BY DYES IRRADIATED BY LASER LIGHT,
John A. Sousa, and Joseph F. Roach. 1972, 10p

Descriptors: (*Clothing, *Fluorescence), (*Infrared detectors, Fluorescence), Dyes, Camouflage, Target discrimination, Light pulses, Irasers, Night vision, Gas lasers.
Identifiers: *Laser induced fluorescence, Personnel detection, Helium neon lasers.

To reduce the detectability of the soldier under field conditions using currently available visual and electro-optical methods, several dyes have been integrated into military equipment to blend in with the background. The authors have established that this method of approach would likely be inefficacious against multiple wavelength laser emission since materials, on the absorption of laser light, would luminesce and emit light at a wavelength differing from the laser. They have pursued luminescence studies of dyed systems and found an effective method for using this characteristic of light emission to defeat the purpose for which coloring schemes are intended.

AD-750 383 PC$3.00/MF$0.95
Army Electronics Technology and Devices Lab Fort Monmouth N J
LIGHTWEIGHT, SMALL LASER TRANSMITTER DESIGN FOR RANGEFINDERS,
John Hynd, John W. Strozyk, and Jesse Moss, Jr. 1972, 14p

Descriptors: (*Lasers, Range finding), Portable, Performance (Engineering), Specifications, Irasers.
Identifiers: *Laser range finders, Neodymium lasers, YAG lasers, AN/GVS-5.

The feasibility of building a small, lightweight 'Q' switch laser oscillator to meet certain physical, electrical and laser specifications, was demonstrated. (Author)

AD-750 402 PC$3.00/MF$0.95
Ail Deer Park N Y
10/6 MICROMETER DETECTOR ARRAY.
Quarterly rept. no. 1, 1 Apr-1 Jul 72,
R. Lange, A. DiNardo , R. Augeri, and D. Yustein. Oct 72, 38p Rept no. AIL-0123-I-1
Contract N00014-72-C-0446, ARPA Order-1806

Descriptors: (*Infrared receivers, Design), Infrared detectors, Infrared telescopes, Lenses, Optical properties, Coherent radiation, Photodiodes, Cadmium compounds, Mercury compounds, Tellurides, Cryogenics.
Identifiers: Mercury tellurides, Cadmium tellurides, Laser beams, Photovoltaic cells.

An optical design approach is presented with supporting optical field patterns calculated on a digital computer for a 10 x 10 element array of PV-HgCdTe elements operating in the heterodyne mixing mode at 10.6 micrometers. Mixed field patterns across the surface of the detector were calculated along with the far field diffraction pattern of the array showing the signal crossover levels between adjacent elements of the array. Also discussed is an analysis of the power dissipation requirements of the photovoltaic mixers at 77 K. The local oscillator heating proved to be the highest with about 2 milliwatts dissipation required for near quantum noise limited operation at 1500 MHz. For a narrower bandwidth system of 150 MHz, the local power dissipation requirement may be reduced to several tenths of a milliwatt with the photodiode leakage current becoming the predominant power dissipating element. (Author)

AD-751 000 Reprint
Nebraska Univ Lincoln Behlen Physics Lab

PYROELECTRIC DETECTION PROPERTIES OF GADOLINIUM MOLYBDATE (GMO),
F. G. Ullman, B. N. Ganguly, and J. R. Zeidler. 1972, 12p AFOSR-TR-72-2073
Grant AF-AFOSR-1926-70
Availability: Pub. in Jnl. of Electronic Materials, v1 n3 p425-434 Aug 72.

Descriptors: (*Infrared detectors, *Ferroelectric crystals), (*Molybdates, Ferroelectric crystals), Gadolinium compounds, Test methods.
Identifiers: *Pyroelectricity, *Gadolinium molybdates.

The pyroelectric detection properties of gadolinium molybdate (GMO) crystals have been studied near and at its 159C ferroelectric transition temperature. Responsivity and detectivity figures of merit for TGS and SBN detectors. Since GMO does not exhibit a dielectric anomaly, it can be used as a threshold detector by heating through the transition temperature from a pre-selected temperature increment below the transition. Voltagesensitive pyroelectric currents at the transition, found previously, permit voltage control of the threshold. (Author)

N72-28468 PC$5.25/MF$0.95
Barnes Engineering Co., Stamford, Conn.
SYSTEM DESIGN AND PERFORMANCE OF EARTH/LUNAR HORIZON SENSOR BEC PROJECT 3744.
Final Report
F. Schwarz, T. Falk, G. Falbel, and P. Spangenberg. 21 Oct 66, 62p NASA-CR-115750, TR-3744-11A
Contract NAS9-4962

Descriptors: *Earth surface, *Equipment specifications, *Horizon scanners, *Lunar topography, Infrared scanners, Operational problems, Quality control, Structural design.

For abstract, see STAR 10 19.

N72-30390 PC$5.00/MF$0.95
Stanford Univ., Calif. W. W. Hansen Laboratories of Physics.
PRECISION STAR-TRACKING TELESCOPE.
Final Report
W. M. Fairbank, and C. W. Everitt. Jul 72, 59p
NASA-CR-123811
Contract NAS8-25705

Descriptors: *Astronomical telescopes, *Gyroscopes, *Spaceborne telescopes, *Star trackers, Attitude control, Automatic gain control, Spaceborne astronomy.

For abstract, see STAR 10 21.

N72-30410 PC$8.00/MF$0.95
Battelle Inst., Frankfurt Am Main (West Germany).
EXPERIMENTAL VERIFICATION AND ASSESSMENT OF AN IR RADIATION MODULATOR BASED ON A FABRY-PEROT ETALON.
E. G. Lierke. Nov 71, 121p ESRO-CR-62
Contract ESTEC-1211/70

Descriptors: *Fabry-perot interferometers, *Infrared radiation, *Light modulation, *Modulators, Aerospace environments, Infrared scanners, Piezoelectric crystals, Satellite instruments, Standards, Technology assessment, Temperature compensation.

For abstract, see STAR 10 21.

17G. Navigation and Guidance

AD-750 787 PC$3.00/MF$0.95
Massachusetts Inst of Tech Lexington Lincoln Lab

ATC (AIR TRAFFIC CONTROL) SURVEILLANCE/COMMUNICATION ANALYSIS AND PLANNING.
Quarterly technical summary rept. no. 41, 1 Jun-31 Aug 72.
1 Sep 72, 33p FAA-RD-72-107
Contracts DOT-FA72WAI-242, F19627-70-C-0230
See also report dated 1 Jun 72, AD-742 144.

Descriptors: (*Air traffic control systems, *Doppler radar), Data transmission systems, Radar clutter, Radar tracking, Aircraft antennas, S band.
Identifiers: Collision avoidance.

FAA funded ATC Surveillance/Communication Analysis and Planning activities during the period 1 June to 31 August 1972 are reported. Surveillance studies bearing upon possible courses of action to improve the performance of the present ATCRBS equipment and to equip present ARSR/ASR radars with state-of-the-art clutter reduction capability are discussed. An improved surveillance radar concept is formulated, and plans to implement this radar in a demonstration model are described. Communication studies just getting under way are outlined. The concluding section describes two preliminary flight tests performed to validate procedural and data reduction plans for the ATCRBS transponder switched antenna tests. (Author)

AD-750 869 PC$3.00/MF$0.95
Frank J Seiler Research Lab United States Air Force Academy Colo
ACTIVE CONTROL OF A PNEUMATIC ISOLATION SYSTEM,
Dino A. Lorenzini. Aug 72, 10p Rept no. SRL-TR-72-0017

Descriptors: (*Stabilized platforms, Inertial guidance), Pneumatic systems, Seismometers, Control systems, Equations of motion, Stabilization, Seismic waves.
Identifiers: Six degrees of freedom, Degrees of freedom.

A pneumatically isolated test platform has been modified to provide active control to the local gravity vector. A combination of sensors, including tiltmeters, angular accelerometers, seismometers, and a gyrocompass measure total platform motion between 0 and 100 Hz. Electrical-to-pressure transducers control the air pressure in the supporting cylinders for low-frequency stabilization. Small electromagnetic shakers provide the necessary mid-frequency control forces. The pneumatic supports themselves provide excellent passive isolation against higher frequency disturbances. This active platform control scheme will be used to investigate the effects of seismic level disturbances on the evaluation of precision inertial components. (Author)

AD-750 890 PC$3.00/MF$0.95
Northrop Corp Norwood Mass Precision Products Dept
A LONG-TERM GYROCOMPASS TEST.
Final rept. Nov 71-Jun 72,
Robert L. McLaughlin. 15 Jul 72, 26p AFCRL-72-0555
Contract F19628-72-C-0020

Descriptors: (*Gyro compasses, Performance (Engineering)), Test methods, Accuracy, Test equipment, Computer programs.

The work was undertaken as a joint effort between Air Force Cambridge Research Laboratories and Northrop to investigate certain gyrocompass performance characteristics. It has been realized that a rate sensing gyrocompass is sensitive to environmental influences and that these influences can affect the accuracy of the measurement in very subtle ways. Specifically the paper addresses gyrocompass resolution; long-term accuracy, statistical attributes of the gyro, and the gyro as a geophysical tool. (Author)

AD-750 939 PC$3.00/MF$0.95
Stanford Research Inst Menlo Park Calif
THE AIR TRAFFIC CONTROLLER'S CONTRIBUTION TO ATC (AIR TRAFFIC CONTROL) SYSTEM CAPACITY IN MANUAL AND AUTOMATED ENVIRONMENTS. VOLUME I: SUMMARY REPORT.
Interim rept. no. 2 Jun 71-Jun 72,
R. S. Ratner, J. O. Williams, M. B. Glaser, and S. E. Stuntz. Jun 72, 52p FAA-RD-72-63-Vol-1
Contract DOT-FA70WA-2142
See also Volume 2, AD-750 940.

Descriptors: (*Air traffic control systems, *Reviews), (*Air traffic controllers, Decision making), Performance (Human), Automation, Environment.

Volume I contains sufficient background material to put the work in perspective, summarizes the methodology used, and presents the study findings and implications for effective automation, as well as quantative capacity estimates and predictions. The methodology is based on a technique called the Relative Capacity Estimating Process (RECEP), developed to assess the implications of controller judgmental factors and decision processes for attainable capacity at several levels of automation. RECEP incorporates a technique of sector operational measurement that includes video recording and structured controller interviews. The technique has been applied to various types of transition, terminal interface, and en route sector operations in several FAA facilities. Results obtained include capacity estimates, for each of the airspace sectors studied, as operated at present and at several future levels of automation. (Author)

AD-750 940 PC$3.00/MF$0.95
Stanford Research Inst Menlo Park Calif
THE AIR TRAFFIC CONTROLLER'S CONTRIBUTION TO ATC (AIR TRAFFIC CONTROL) SYSTEM CAPACITY IN MANUAL AND AUTOMATED ENVIRONMENTS. VOLUME II: APPENDICES.
Interim rept. no. 2 Jun 71-Jun 72,
R. S. Ratner, J. O. Williams, M. B. Glaser, S. E. Stunz, and G. L. Couluris. Jun 72, 155p FAA-RD-72-63-Vol-2
Contract DOT-FA70WA-2142
See also Volume 1, AD-750 939.

Descriptors: (*Air traffic control systems, *Reviews), (*Air traffic controllers, Decision making), Automation.

A detailed description is given of the methodology used in investigations of the air traffic controller's contribution to capacity in manual and automated environments. ATC decision-making processes and the role of controller judgment are discussed. Control and operating concepts are presented for the automation levels studied. The relative capacity estimating process (RECEP) is described in detail, along with the data collection and measurement program. The result of a survey of non-atc automation applications, to uncover systems analogous to ATC, is reported. (Author)

AD-750 990 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
NAVIGATIONAL RELIABILITY USING A NAVIGATIONAL DIGITAL COMPUTER,
V. A. Prokofev. 22 Sep 72, 12p Rept no. FTD-HT-23-1255-72
Edited trans. of Tsentralnyi Nauchno-Issledovatelskii Institut Morskogo Flota. Trudy (USSR) n131 p25-29 1970, by David H. Toney.

Descriptors: (*Navigation computers, Reliability (Electronics)), Digital computers, Navigation, USSR.
Identifiers: Translations.

Requirements imposed on the reliability of navigational digital computers are discussed. (Author)

N72-28107 PC$3.00/MF$0.95
Defence and Civil Inst. of Environmental Medicine, Downsview (Ontario). Behavioral Sciences Div.
HUMAN ENGINEERING ASSESSMENT OF VFR CABS.
L. G. Innes. Feb 72, 15p DCIEM-832

Descriptors: *Canada, *Human factors engineering, *Pilot training, *Visual flight rules, Air traffic control, Airport towers, Cost analysis.

For abstract, see STAR 10 19.

N72-28156 PC$3.00/MF$0.95
Office National Detudes Et de Recherches Aerospatiales, Paris (France).
BEARING INSTRUMENT BY STATIC ANTENNAS. APPLICATION TO MARITIME COLLISION AVOIDANCE.
G. Ringenbach. 1972, 6p ONERA-TP-1061
Conf- Presented At Iee Conf. on Maritime Navigation Aids, London, 25-27 Jul. 1972

Descriptors: *Accident prevention, *Antenna radiation patterns, *Radio antennas, *Warning systems, Collision avoidance, Numerical analysis, Surface navigation.

For abstract, see STAR 10 19.

N72-28479 PC$8.25/MF$0.95
Laboratoire de Recherches Balistiques Et Aerodynamiques, Vernon (France).
EVALUATION OF THE KEARFOTT GYROSCOPE, TYPE GYROFLEX, MOD. 2 RESULTS OBTAINED WITH THE GYROSCOPE NO. 3441 . EVALUATION DU GYROSCOPE KEARFOTT TYPE GYROFLEX MOD 2 RESULTATS OBTENUS SUR LAPPAREIL NO. 3441.
26 Apr 71, 122p LRBA-E-209-NT-1/SIE
Contract DTEN-71/179

Descriptors: *Acceptability, *Gyroscopes, *Performance tests, Angular resolution, Drift (instrumentation), Elastic anisotropy, Electric motors, Linearity, Onboard equipment.

For abstract, see STAR 10 19.

N72-28662 PC$10.25/MF$0.95
Litchford Systems, Northport, N.Y.
BROADCAST CONTROL OF AIR TRAFFIC.
G. B. Litchford. Apr 72, 162p NASA-CR-127452
Contract NASW-2247

Descriptors: *Accident prevention, *Air traffic control, *Flight safety, *Pilot performance, Airborne equipment, Electronic equipment, Systems engineering, Telecommunication.

For abstract, see STAR 10 19.

N72-28664 PC$23.50/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Charles Stark Draper Lab.
CANDIDATE CONFIGURATION TRADE STUDY, STELLAR-INERTIAL MEASUREMENT SYSTEMS (SIMS) FOR AN EARTH OBSERVATION SATELLITE (EOS).
Interim Technical Report
G. Ogletree, J. Coccoli, R. Mckern, M. Smith, and R. White. 15 Jun 72, 424p NASA-CR-115709, E-2651
Contract NAS9-4065

Descriptors: *Celestial navigation, *Inertial navigation, *Satellite guidance, *Systems analysis, Equipment specifications, Gyroscopes, Space navigation, Star trackers.

For abstract, see STAR 10 19.

N72-28665 PC$4.50/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
HIGH ENERGY ASTRONOMY OBSERVATORY STAR TRACKER SEARCH PROGRAM.
W. J. Weiler. 6 Mar 72, 46p NASA-TM-X-64680

Descriptors: *Attitude control, *Guidance sensors, *Heao, *Star trackers, Computer programs, Evaluation, Performance prediction.

For abstract, see STAR 10 19.

N72-28668 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
STABILITY CONDITIONS OF A GRAVITATIONAL STABILIZATION SYSTEM FOR SATELLITES WITH HYDRAULIC DAMPING.
V. A. Sarychev. Jul 72, 13p NASA-TT-F-14382
Contract NASW-2035
Tran- Transl. Into English From Trans. of the 2d Intern. Symp. of Ifac for Autom. Control in the Peaceful Use of Outer Space, Upravleniye Kosmicheskimi Kosmicheskimi Apparatami I Korablyami Moscow, Nauka Press, 1971

Descriptors: *Gyrostabilizers, *Hydraulic control, *Satellite control, *Spacecraft stability, Coordinates, Damping, Dynamic response, Numerical analysis.

For abstract, see STAR 10 19.

N72-28674 PC$4.00/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Charles Stark Draper Lab.
GYRO AND ACCELEROMETER FAILURE DETECTION AND IDENTIFICATION IN REDUNDANT SENSOR SYSTEMS.
J. E. Potter, and J. C. Deckert. May 72, 36p
NASA-CR-115749, E-2686
Contracts NAS9-4065, DSR PROJ. 55-39100

Descriptors: *Accelerometers, *Algorithms, *Gyroscopes, Failure, Monte carlo method, Redundancy.

For abstract, see STAR 10 19.

N72-28676 PC$4.75/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Brunswick (West Germany). Inst. Fuer Flugfuehrung.
EARTH FLATTENING EFFECT ON POSITION FIXING BY TWENTY-FOUR HOUR SATELLITES . DER EINFLUSS DER ABPLATTUNG DER ERDE AUF DIE ORTUNG MITTELS 24H--SATELLITEN.
O. Weber. Jan 72, 51p DLR-FB-72-20
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Air navigation, *Earth (planet), *Satellite navigation systems, Ellipsoids, Flattening, Flight altitude, Position errors, Positioning, Rangefinding, Twenty-four hour orbits.

For abstract, see STAR 10 19.

N72-28677 PC$8.00/MF$0.95
Deutsches Geodaetisches Forschungsinstitut, Munich (West Germany).
THE SIGNIFICANCE OF THE ELLIPSOIDAL FORM OF THE EARTH IN AIR NAVIGATION . DIE BERUECKSICHTIGUNG DER ELLIPSOIDGESTALT DER ERDE IN DER FLUGNAVIGATION.
Ph.D. Thesis - Stuttgart Univ.
L. J. Kieffer. 1971, 120p SER-C/DISS-166

Descriptors: *Air navigation, *Earth (planet), *Formulas (mathematics), Coordinate transformations, Doppler navigation, Ellipsoids, Flattening, Flight altitude, Geodetic coordinates, Gyrocompasses, Inertial navigation, Tacan.

For abstract, see STAR 10 19.

N72-29670 PC$7.50/MF$0.95
Ball Bros. Research Corp., Boulder, Colo.
FABRICATION AND TEST OF EIGHT SETS OF STRAP 3 FLIGHT HARDWARE.
Final Report
M. E. Greeb. 15 Mar 72, 110p NASA-CR-122516, F72-03
Contract NAS5-11664

Descriptors: *Attitude control, *Missile control, *Sounding rockets, *Star trackers, Equipment specifications, Performance tests, Systems engineering.

For abstract, see STAR 10 20.

N72-30583 PC$7.25/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Charles Stark Draper Lab.
DYNAMIC TESTING OF A SINGLE-DEGREE-OF-FREEDOM STRAPDOWN GYROSCOPE.
C. B. Lory, J. Feldman, and J. S. Sinkiewicz, Jr. Oct 71, 104p NASA-CR-123804, E-2618
Contracts NAS12-2033, MIT PROJ. 55-34010

Descriptors: *Degrees of freedom, *Gyroscopes, *Gyroscopic stability, *Strapdown inertial guidance, Equipment specifications, Numerical analysis, Performance tests.

For abstract, see STAR 10 21.

N72-30586 PC$10.00/MF$0.95
Stanford Univ., Calif. Dept. of Applied Mechanics.
IMPROVED NAVIGATION BY COMBINING VOR/DME INFORMATION WITH AIR OR INERTIAL DATA.
J. C. Bobick, and A. E. Bryson, Jr. May 72, 156p NASA-CR-124826, SUDAAR-442
Contracts NGL-05-020-007, F33615-72-C-1297
Subm- Sponsored in Part By Nsf

Descriptors: *Airspeed, *Distance measuring equipment, *Inertial navigation, *Vhf omnirange navigation, Position errors, Position indicators, Range errors, Range finders.

For abstract, see STAR 10 21.

17H. Optical Detection

N72-28455 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LIGHT-DETECTION ELECTRONICS FOR A RAMAN LIDAR.
R. J. Leser, and J. A. Salzman. Jul 72, 28p NASA-TN-D-6879, E-6864

Descriptors: *Optical measurement, *Optical radar, *Raman spectra, Atmospheric temperature, Electronic equipment, Light scattering, Performance tests, Photomultiplier tubes, Remote sensors.

For abstract, see STAR 10 19.

N72-28699 PC$4.50/MF$0.95
California Univ., La Jolla. Dept. of Applied Physics and Information Sci.
THE APPLICATION OF SIGNAL DETECTION THEORY TO OPTICS.
Semiannual Status Report, 15 Oct. 1971 - 15 Mar. 1972
C. W. Helstrom. 15 Mar 72, 49p NASA-CR-122449
Contract NGL-05-009-079

Descriptors: *Optics, *Signal detection, Estimating, Images, Photoelectrons.

For abstract, see STAR 10 19.

N72-30445 PC$3.00/MF$0.95
Texas Univ., Austin.
LUNAR LASER RANGING DATA DEPOSITED IN THE NATIONAL SPACE SCIENCE DATA CENTER FILTERED OBSERVATIONS FOR SEPTEMBER 1969 THROUGH JUNE 1970 AND UNFILTERED PHOTON DETECTIONS FOR JULY THROUGH DECEMBER 1970.
J. D. Mulholland, P. J. Shelus, and K. Terrell. Jan 72, 8p NASA-CR-127348, RM-72-003
Contract NGR-44-012-219

Descriptors: *Apollo applications program, *Laser range finders, *Lunar observatories, Accuracy, Data acquisition, Equipment specifications.

For abstract, see STAR 10 21.

17I. Radar Detection

AD-750 323 PC$3.00/MF$0.95
Army Air Defense Board Fort Bliss Tex
MISS DISTANCE RADAR (MIDI) - A DEVELOPMENT FOR AIR DEFENSE WEAPONS TESTING,
Charles E. French. 1972, 15p

Descriptors: (*Radar tracking, *Firing error indicators), (*Aerial targets, *Miss distance), Monopulse radar, Radar echo areas, Radar antennas, Range gating, Data processing systems, Fire control system components, Firing tests (Ordnance).
Identifiers: Miss distance radar, MIDI radar.

Through the support of U. S. Army Test and Evaluation Command (TECOM) Instrumentation Development Program, U. S. Army Materiel Command (AMC), a modern miss distance measuring system is under development. The system embodies a ground-based radar system and effectively offsets the limitation of optical instrumentation. The feasibility for the concept was developed by the U. S. Army Air Defense Board, demonstrated during 1970, and culminated in a series of live firing tests at Fort Bliss, Texas. (Author)

AD-750 328 PC$3.00/MF$0.95
Army Missile Command Redstone Arsenal Ala
RADAR ARRAYS WITH NO PHASE SHIFTERS,
Richard L. Hartman. 1972, 13p

Descriptors: (*Radar antennas, *Antenna arrays), Aircraft defense systems, Phase detectors, Processing, Integral transforms, Radar reflections, Detection, Computers, Optical equipment, Real time.
Identifiers: Signal processing.

The purpose of this paper is to explain the unphased array concept and to demonstrate detection of simulated targets with this approach. Application is in the area of air defense systems.

AD-750 370 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
DOPPLER TRANSLATOR,
Otto E. Rittenbach. 1972, 14p

Descriptors: (*Doppler radar, Combat surveillance), (*Man-machine systems, Doppler radar), Auditory signals, Doppler effect, Detection, Radar equipment, Processing, Portable.
Identifiers: Signal processing.

Different doppler processors have been evaluated for their suitability to overcome various shortcomings. The paper concentrates on applications to Combat Surveillance Radars, especially those requiring small weight and power consumption. Theoretical and experimental studies were made of techniques suitable for presentation of marginally audible doppler frequencies to the ear: amplitude modulation and time compression show promise. Tests with a breadboard model confirmed the predictions of the study.

AD-750 486 PC$3.00/MF$0.95
Ohio State Univ Columbus Electroscience Lab
COMPUTATION OF LOW FREQUENCY SCATTERING FROM AIRPLANES.
Technical rept.,
Y. T. Lin. Sep 72, 76p Rept no. ESL-2768-9
AFOSR-TR-72-1991
Grant AF-AFOSR-1710-69

Descriptors: (*Radar echo areas, Aircraft), Backscattering, Numerical analysis, Target recognition.

An efficient computational technique for obtaining radar scattering cross sections of electrically small airplanes is achieved by using a wire-grid reaction method. In this method, the airplane shape is approximated by a grid of thin wires, thereby leading to a mathematical representation of the airplane in the form of matrix, whose elements are evaluated by established reaction techniques, and which when inverted, yield scattering data very efficiently. A variety of wire-grid approximations were postulated for square plates, circular cylinders and several airplane types. (Author)

AD-750 667 PC$3.00/MF$0.95
Naval Research Lab Washington D C
TAPE PLAYBACK AND SERIAL-TIME DECODER FOR IFF (IDENTIFICATION FRIEND OR FOE) FLIGHT TEST INSTRUMENTATION.
Interim rept.,
Charles E. Quigley. 3 Oct 72, 26p Rept no. NRL-7450

Descriptors: (*Identification systems, Radar equipment), Decoding, Synchronization (Electronics), Shift registers, Magnetic tape.
Identifiers: IFF (Identification friend or foe), Identification friend or foe, Decoders.

The tape playback and serial-time decoder described in the report has been developed for evaluating event data recorded on magnetic tape during flight tests of the Hartlobe/Diversity dual-antenna system for airborne IFF transponders. Means are provided to recover pulse-duration-modulated (PDM)-multiplexed data from five playback channels of the instrumentation tape recorder to provide ten data channels for 35-mm oscillographic film records. Also, a serial-time code from another playback channel is used to synchronize an internal clock to provide the capability to superimpose on the oscillographic film record the time of day that the flight test data were originally recorded. Though the internal clock is primarily intended for use with the magnetic tape playback, a means is also available for operation as a completely self-contained, crystal-controlled, electronic clock with serial and parallel output signals. (Author)

AD-750 668 PC$3.00/MF$0.95
Naval Research Lab Washington D C
POINT-SCATTERER FORMULATION OF TERRAIN CLUTTER STATISTICS.
Final rept.,
G. R. Valenzuela, and M. B. Laing. 27 Sep 72, 48p Rept no. NRL-7459

Descriptors: (*Radar clutter, Terrain), Side-looking radar, Statistical distributions, Distribution functions, Probability density functions, Scattering, Scintillation.
Identifiers: Kolmogorov-Smirnov test, Electromagnetic scattering, Statistical inference, Central limit theorem.

The first-order statistics of terrain clutter are investigated theoretically and experimentally. The return from a point-scatterer (a scintillating signal) is used as a basis for generating the statistical properties of terrain clutter as observed by side-looking airborne radars. According to the model the limiting distribution of terrain clutter are the Gaussian distribution and the distribution for a scintillating signal (specular clutter). An array of point-

scatterers within the radar beam produces clutter which has long tails similar to those of a lognormal distribution. The convergence of the first-order statistics of a scintillating signal to the statistics of a sinusoidal signal is demonstrated. Also, the statistics of terrain clutter are inferred from data taken with the Naval Research Laboratory's Four Frequency Radar System by the Kolmogorov–Smirnov test of the cumulative distribution and by the computation of the first five central moments of the normalized radar cross section of terrain (in decibels). (Author)

AD-750 695 PC$3.00/MF$0.95
Naval Training Equipment Center Orlando Fla
EVALUATION OF DATA COMPRESSION TECHNIQUES FOR RADAR LANDMASS TERRAIN DATA.
Technical rept.,
Alexander James Grant. Jul 72, 172p Rept no. NAVTRAEQUIPCEN-IH-211

Descriptors: (*Radar scanning, Terrain), (*Naval training, Radar operators), (*Flight simulators, Terrain avoidance), Simulation, Display systems, Video signals, Target recognition, Pennsylvania, Theses.
Identifiers: *Landmass simulators, Terrain following.

The objective of this research is to develop an objective evaluation method for determining the goodness of various data compression techniques applied to radar landmass simulation data, to validate the objective evaluation method by comparison with a subjective evaluation performed by experienced radar operators and to compare the objective evaluation with the currently used terrain RMS error criteria. This research consists of the computation of simulated radar shadow displays, the computation of various measures of goodness which are combined in a performance criteria, and the subjective evaluation of the simulated displays. The objective evaluation method which is developed measures the goodness of the data compression techniques in terms of the usefulness of the simulated radar displays. The results obtained demonstrates the inadequacy of the terrain RMS error criteria and the degrading smoothing effect introduced by polynomial data compression. It is recommended that, prior to the implementation of any terrain data compression technique in a radar landmass simulator, it be evaluated in the manner proposed. (Author)

AD-750 747 PC$3.00/MF$0.95
Massachusetts Inst of Tech Lexington Lincoln Lab
A THEORY FOR OPTIMAL MTI (MOVING TARGET INDICATOR) DIGITAL SIGNAL PROCESSING: PART II. SIGNAL DESIGN.
Technical note,
Robert J. McAulay. 4 Oct 72, 59p Rept no. TN-1972-14-Pt-2 ESD-TR-72-217
Contract F19628-73-C-0002
See also Part 1, AD-738 298.

Descriptors: (*Moving target indicators, *Air traffic control systems), (*Radar targets, Target recognition), Doppler effect, Radar clutter, Decision theory, Statistical analysis, Information theory, Gain, White noise, Probability density functions, Radar signals, Integral transforms, Fourier analysis.
Identifiers: Signal processing, Fourier transformation, Ambiguity functions.

In part 1 of the report the optimum MTI receiver was derived and analyzed for the case in which the radar pulses were emitted from the transmitter equally spaced in time. For typical long range ATC surveillance radars, aliasing of the target and clutter spectra results in detection blind speeds at multiples of approximately 70 knots. It is well known operationally that these blind speeds can be eliminated by staggering the transmitter PRF. Heretofore, there has been no thorough theoretical analysis of the effect of staggered PRF on the spectral distribution of the target and clutter signals. It is shown in part 2 that the clutter spectral density continues to fold over at the PRF, but that the signal spectrum becomes dispersed in frequency, somewhat like an anti-jam signal. It is further noted that even when the target Doppler shifts are more than one PRF apart, the spectra are distinguishable, suggesting that unambiguous Doppler estimation may be possible. (Author)

AD-750 855 PC$3.00/MF$0.95
Naval Intelligence Support Center Washington D C Translation Services Div
PASSIVE RADAR (PASSIVNAYA RADIOLOKATSIYA),
A. Nikolaev. 29 Sep 72, 10p Rept no. NISC-Trans-3347
Trans. of Aviatsiya i Kosmonavtika (USSR) n1 p73-77 1964.

Descriptors: (*Radar, Passive), Radar receivers, Detection, USSR, Infrared scanning.
Identifiers: Translations.

The report discusses the uses and limitations of passive radar.

AD-750 871 MF$0.95
Naval Intelligence Support Center Washington D C Translation Services Div
SHIPBOARD RADARS AND THEIR USE,
Ya. I. Berman, V. I. Vlasov, N. L. Kogan, V. I. Rakov, and V. L. Skvortsov. 29 Sep 72, 129p Rept no. NISC-Trans-3348
Trans. of mono. Sudovye Radioloksionnye Stantsii i ikh Primenenie, Leningrad, 1970 v2 p274-342, 437-503.
Availability: Available in microfiche only.

Descriptors: (*Radar antennas, Ship antennas), (*Radar tracking, Automatic), Antenna radiation patterns, Scanning, Antenna configurations, Radar equipment, USSR.
Identifiers: Translations.

Contents:
Antenna systems--Controlling antenna patterns;
Automatic target tracking systems.

AD-751 015 Reprint
New York Univ Bronx Geophysical Sciences Lab
AVERAGE RETURN PULSE FORM AND BIAS FOR THE S193 RADAR ALTIMETER ON SKYLAB AS A FUNCTION OF WAVE CONDITIONS,
Willard J. Pierson, Jr., and Emanuel Mehr. 1971, 11p Rept no. Contrib-111
Contract N63206-70-A-0075-0005
Availability: Pub. in Geophysical Monograph Series, v15 (The Use of Artificial Satellites for Geodesy) p217-226 n.d.

Descriptors: (*Distance-measuring equipment, Space-to-surface), (*Spacecraft components, *Radio altimeters), (*Ocean waves, Radar reflections), Manned spacecraft, Range finding, Probability density functions.
Identifiers: Remote sensing, Skylab spacecraft, Ocean surface.

The average return echo power for the radar altimeter (S193) on Skylab will be beam limited, so that it will rise to peak return in 100 nsec and fall to nearly zero in about another 400 nsec once the altimeter has searched out the nadir direction. A split-gate tracking loop with the gates separated by 50 nsec will be used. The effects of varying wave height and wave spectra on the shape of the return pulse and on the measurement of the range are calculated in terms of a convolution involving the probability density function of the wave elevations and the shape of the radar signal. The assumptions made in the calculations have been verified by measurements made by others from aircraft and towers. (Author)

N72-28158 PC$3.00/MF$0.95
Ohio State Univ., Columbus. Dept. of Electrical Engineering.
A THEORETICAL STUDY OF RADAR RETURN AND RADIOMETRIC EMISSION FROM THE SEA.
W. H. Peake. Jul 72, 11p NASA-CR-2092, REPT-3030-2
Contract NAS1-9998

Descriptors: *Electromagnetic scattering, *Ocean surface, *Radar scattering, Mathematical models, Microwave emission, Microwave scattering, Surface roughness effects.

For abstract, see STAR 10 19.

N72-28179 PC$3.75/MF$0.95
Forschungsinstitut Fuer Funk Und Mathematik, Werthoven (West Germany).
RESEARCH ON SEQUENTIAL DETECTION . UNTERSUCHUNGEN ZUR SEQUENTIAL-ENTDECKUNG.
W. D. Wirth. Mar 70, 35p REPT-144
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Phased arrays, *Radar targets, *Sequential analysis, *Target recognition, *Testing time, Electronic control, Pulse radar, Statistical tests.

For abstract, see STAR 10 19.

N72-28180 PC$8.75/MF$0.95
Forschungsinstitut Fuer Funk Und Mathematik, Werthoven (West Germany).
AN ADAPTIVE PRE-WHITENING FILTER (DESCRIPTION OF THE ARITHMETIC UNIT) . EIN ADAPTIVES PRE-WHITENING-FILTER (BESCHREIBUNG DER RECHENEINHEIT).
R. Klemm. Dec 71, 135p REPT-178
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Adaptive filters, *Algorithms, *Arithmetic and logic units, *Clutter, *Radar data, Autocorrelation, Doppler radar, Noise reduction, Real time operation, Suppressors, White noise.

For abstract, see STAR 10 19.

N72-28181 PC$6.25/MF$0.95
Forschungsinstitut Fuer Funk Und Mathematik, Werthoven (West Germany).
EXPECTANCY AREAS WITH A MEASURING ERROR. PART 2 THE SYSTEM AND EXEMPLARY RESULTS . ERWARTUNGSGEBIETE MIT EINEM MESSFEHLER. 2 DAS SYSTEM UND EXEMPLARISCHE ERGEBNISSE.
L. Schuberth. May 71, 84p REPT-124
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Aircraft detection, *Radar scanning, *Tracking radar, Area, Computer programs, Computerized simulation, Errors, Flight characteristics, Probability theory, Pursuit tracking.

For abstract, see STAR 10 19.

N72-28182 PC$7.25/MF$0.95
Forschungsinstitut Fuer Funk Und Mathematik, Werthoven (West Germany).
PHASED ARRAY AND MULTIPLE RADAR RESEARCH ACTIVITIES . JAHRESBERICHT 1971.
Annual Report, 1971
Jan 72, 102p

Descriptors: *Clutter, *Coherent radar, *Electronic control, Data processing, Radar data, Radar detection, Radar targets, Sequential analysis, Surveillance radar.

For abstract, see STAR 10 19.

N72-30154 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ON BACKSCATTER FROM SPATIALLY VARYING SURFACES.
N. C. Grody. Aug 72, 16p NASA-TM-X-66010, X-733-72-311
Subm- Submitted for Publication

Descriptors: *Backscattering, *Surface roughness, Integral equations, Radar equipment.

For abstract, see STAR 10 21.

17J. Seismic Detection

AD-750 540 PC$3.00/MF$0.95
Teledyne Geotech Alexandria Va Seismic Data Lab
CODA SUPPRESSION CAPABILITIES OF THE BEAM AND MIXED-SIGNAL PROCESSOR,
T. J. Cohen. 30 Aug 72, 61p Rept no. SDL-298
Contract F33657-72-C-0009, ARPA Order-1714

Descriptors: (*Underground explosions, Detection), (*Seismic waves, Spectrum analyzers), Earthquakes, Nuclear explosions, Least squares method, Attenuation, Signal-to-noise ratio.
Identifiers: Signal processing, Vela Uniform, Spectrum analysis.

A comparison has been made of the coda attenuation capabilities of the beam and mixed-signal processor using 7- and 19-element TFO subarrays. The major source region was taken as Semipalatinsk (96 degrees distance from TFO), while the interfering signals from various earthquakes were time-shifted to simulate arrivals from various azimuths at 60 degrees distance. Conclusion are discussed.

AD-750 759 PC$3.00/MF$0.95
Texas Instruments Inc Dallas Services Group
EXTENDED ARRAY EVALUATION PROGRAM.
Quarterly rept. no. 1, 1 Apr-30 Jun 72,
Terence W. Harley. 15 Jul 72, 16p
Contract F33657-72-C-0725, ARPA Order-1714

Descriptors: (*Seismological stations, Spectrum analyzers), (*Underground explosions, Detection), Seismometers, Networks, Sampling, Earthquakes, Nuclear explosions, Data processing systems, Errors, Noise.
Identifiers: NORSAR (Norwegian Seismic Array), Norwegian seismic array, Long period seismometers, ALPS (Alaskan Long Period Array), Alaskan long period array, Vela uniform, Signal processing.

The first quarterly report summarizes progress under the extended evaluation of the ALPA, NORSAR, and LPE program. Work through 30 June 1972 in the following areas is summarized: ALPA evaluation; NORSAR long period evaluation; NORSAR short period evaluation; LPE evaluation; Network analysis.

AD-750 779 PC$3.00/MF$0.95
Teledyne Geotech Alexandria Va
SEISMIC ARRAY ANALYSIS CENTER.
Quarterly technical summary rept. Apr-Jun 72,
H. Mack. 25 Jul 72, 10p
Contract F33657-72-C-0471, ARPA Order-1620
See also AD-743 070.

Descriptors: (*Seismological stations, Data processing systems), (*Underground explosions, Detection), Seismometers, Networks, Sampling, Earthquakes, Nuclear explosions, Rayleigh waves.
Identifiers: LASA (Large Aperture Seismic Array), Large aperture seismic array, Vela Uniform, Seismic noise, Seismic Array Analysis Center, NORSAR (Norwegian Seismic Array), Norwegian seismic array.

The report summarizes the operations and accomplishments in the Seismic Array Analysis Center for the period of April, May and June 1972.

AD-750 781 PC$3.00/MF$0.95
Teledyne Geotech Alexandria Va Seismic Data Lab
SPECTRAL WHITENING WITH APPLICATION TO EXPLOSION PP,
T. J. Cohen, R. L. Sax, and H. L. Husted. 12 Jan 72, 80p Rept no. SDL-282
Contract F33657-72-C-0009, ARPA Order-1714

Descriptors: (*Seismological stations, Spectrum analyzers), (*Underground explosions, Detection), Seismic waves, Nuclear explosions, Depth finding, Power spectra.
Identifiers: Vela Uniform, Boxcar shot, Chartreuse shot, Duryea shot, Greeley shot, Half beak shot, Knikerbocker shot, Seismic detection, Nuclear explosion detection, Spectrum analysis.

A method is proposed for whitening the spectra of teleseismic P waves to aid in the determination of event depths. The method uses a network of common recording stations, all of which must have recorded signals from a suite of closely-spaced events, e.g., a set of underground explosions. Individual spectra are whitened by removing a path-recording site response determined by averaging spectra from the suite of events as recorded at a single station. The whitened spectra from a single event are then summed over the recording network to yield a whitened source spectra. The whitening process enhances spectra components in the band 2 to 5 Hz. (Author)

18. NUCLEAR SCIENCES AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

N72-28725 PC$3.25/MF$0.95
Nagoya Univ. (Japan). Inst. of Plasma Physics.
SOME ENGINEERING ASPECTS OF JIPP STELLARATOR.
K. Miyamoto, A. Mohri, S. Fujiwaka, N. Inoue, and M. Fukiwara. Apr 72, 23p IPPJ-T-8

Descriptors: *Stellarators, *Structural design, Magnetic fields, Plasma control.

For abstract, see STAR 10 19.

18B. Isotopes

Pat-Appl-sn-266927
PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
APPARATUS FOR PRODUCING HIGH PURITY I-123.
Patent Application
J. W. Blue. Filed 28 Jun 72, 12p
NASA-CASE-LEW-10518-2
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Cyclotron radiation, *Iodine isotopes, *Xenon isotopes, Condensates, Patent applications, Tellurium.

An improved tellurium target is bombarded with a beam from a cyclotron to produce Xe-123 which is carried away by flowing gas streams. Contaminants are first removed from the gas in a dry ice trap and subsequently the Xe-123 condenses in a liquid nitrogen trap where it decays to I-123.

18C. Nuclear Explosions

AD-750 541 PC$3.00/MF$0.95
Teledyne Geotech Alexandria Va
RAYLEIGH WAVE AND ACOUSTIC-GRAVITY WAVE SIGNALS FROM NUCLEAR EXPLOSIONS IN THE ATMOSPHERE.
Final technical rept. 1 Mar 69-31 Mar 72,
C. A. Newton. 31 Aug 72, 26p AFOSR-TR-72-2011
Contract F44620-69-C-0082, ARPA Order-1357

Descriptors: (*Nuclear explosions, Detection), Atmosphere models, Airburst, Height finding, Intensity, Microbarometric waves, Rayleigh waves, Programming (Computers), Spectrum analyzers.
Identifiers: Acoustic gravity waves.

The detection of nuclear explosions in the atmosphere has posed problems to the variety of techniques used to sense the resulting disturbances. Hence, the research covered by the subject contract was directed toward the extraction of intelligence from microbarographic signals. The principal objective was to improve the ability to determine the yield and height of burst of nuclear explosions in the atmosphere. Necessarily there were two related, intermediate objectives: namely, to develop digital data processing techniques for detecting and analyzing signals recorded by microbarograph arrays, and to improve predictions of spectra and waveforms of acoustic-gravity waves as well as of their associated seismic surface waves. (Author)

18F. Radiation Shielding and Protection

N72-28684 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A SHIELDING APPLICATION OF PERTURBATION THEORY TO DETERMINE CHANGES IN NEUTRON AND GAMMA DOSES DUE TO CHANGES IN SHIELD LAYERS.
D. Fieno. 1972, 20p NASA-TM-X-68097, E-7070
Conf- Proposed for Presentation At Natl. Topical Meeting on New Develop. in Reactor Phys. and Shielding, Kiamesha Lake, N. Y., 12-15 Sep. 1972 Sponsored By Am. Nucl. Soc.

Descriptors: *Gamma rays, *Neutron sources, *Perturbation theory, *Radiation shielding, *Reactor safety, Radiation dosage, Reactor design, Reactor technology.

For abstract, see STAR 10 19.

N72-28713 PC$6.00/MF$0.95
Electrotechnical Lab., Tokyo (Japan).
A MONTE CARLO SIMULATION FOR FAST ELECTRON AND PHOTON TRANSPORT IN THICK LAYERS OF MATTER.
H. Sugiyama. Feb 72, 80p RR-724
LANG- IN JAPANESE PARTLY IN ENGLISH

Descriptors: *Electrons, *Monte carlo method, *Photons, Annihilation reactions, Compton effect, Particle interactions, Photoelectric effect, Random numbers, Sampling.

For abstract, see STAR 10 19.

18G. Radioactive Wastes and Fission Products

N72-30567 PC$3.00/MF$0.95
Istituto Di Fisica Dell Atmosfera, Rome (Italy).
METEOROLOGY AND HUMAN ENVIRONMENT TYPICAL CASES OF RADIOACTIVE POLLUTION IN THE ATMOSPHERE . METEOROLOGIA ED AMBIENTE UMANO

CASI TIPICI DI INQUINAMENTO RADIOATTIVO DELLATMOSFERA.
B. Pavesi. Mar 71, 13p IFA-RDP-41
Subm- Prepared Jointly With Aeron. Mil. Ital.

Descriptors: *Italy, *Thermonuclear explosions, *Tropospheric radiation, Dust, Fallout, Meteorology, Radioactive contaminants, Radioactive decay.

For abstract, see STAR 10 21.

18H. Radioactivity

AD-750 342 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
ANISOTROPIC DOSE AND ITS APPLICATIONS IN DIRECTIONAL RADIATION SENSING,
Stanley Kronenberg, Robert A. Lux, Wofgang J. Ramm, Kristian L. Nilson, and Robert L. Pfeffer. 1972, 12p

Descriptors: (*Radiation damage, Anisotropy), (*Dose rate, Nuclear radiation), Dosimeters, Gamma rays, X rays, Materials, Interfaces, Semiconductor devices, Perturbation theory.
Identifiers: Radiation hardening.

While conducting radiation experiments using polyvinyl chloride and photographic film as dosimeters the author noticed anomalous 'hot spots' in dose delivered to regions where there was a perturbation in the atomic number Z close to the dosimeter. These increases in local dose were strongly dependent on the direction of the incident radiation and could be observed even when the perturbation was a very thin layer of different Z material. Such perturbations can affect measurements of gamma and X-ray doses and may be responsible for serious errors in dosimetry if one is not aware of their existence. This effect is discussed in the report.

AD-750 875 PC$3.00/MF$0.95
Air Force Cambridge Research Labs L G Hanscom Field Mass
ABSOLUTE YIELDS OF X-RAY INDUCED PHOTOEMISSION FROM METALS.
Physical sicences research papers,
John N. Bradford. 23 Aug 72, 28p Rept nos. AFCRL-72-0542, AFCRL-PSRP-510

Descriptors: (*Tantalum, Photoelectrons), (*Molybdenum, Photoelectrons), (*Copper, Photoelectrons), (*Aluminum, Photoelectrons), (*Nuclear explosions, X rays), Electromagnetic pulses, Vulnerability, Nuclear radiation, Photoelectric effect (Gamma rays).
Identifiers: Emission spectra, Electron emission, Photoelectric emission.

Absolute electron yields from tantalum, molybdenum, copper and aluminum have been measured for several bombarding geometries. The photon spectra used were derived from filtered bremsstrahlung generated in a tungsten anode at 50 kV, constant potential. The electron spectra were measured by a cylindrical electrostatic analyzer with a secondary emission detector. The spectra exhibit both Auger and scattered photoelectrons. The electron current densities arising from these spectra constitute source functions for vulnerability studies on systems exposed to internal electromagnetic pulse (IEMP) effects arising from nuclear environments. (Author)

N72-30563 PC$5.75/MF$0.95
Istituto Di Fisica Dell Atmosfera, Rome (Italy).
PRELIMINARY RESEARCH ON RADIOACTIVE AIR POLLUTION OBSERVED IN ITALY AFTER THREE NUCLEAR EXPLOSIONS ON 14 OCTOBER 1970 . PRIME INDAGINI SULLINQUINAMENTO RADIOATTIVO DELLARIA RILEVATO IN ITALIA DOPO LE TRE ESPLOSIONI NUCLEARI DEL 14 OTTOBRE 1970.
B. Pavesi, and E. Dietrich. Feb 71, 72p
IFA-RDP-38
Subm- Prepared Jointly With Aeron. Nil. Ital.

Descriptors: *Air pollution, *Italy, *Thermonuclear explosions, China, Dust, Fallout, Polar regions, Radioactive contaminants, Radioactive decay, Stratosphere radiation.

For abstract, see STAR 10 21.

18I. Reactor Engineering and Operation

N72-28683 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CRITICALITY EXPERIMENTS AND ANALYSIS OF MOLYBDENUM REFLECTED CYLINDRICAL URANYL FLUORIDE WATER SOLUTION REACTORS.
D. Fieno, T. Fox, and R. Mueller. Jul 72, 28p
NASA-TN-D-6878, E-6812

Descriptors: *Critical experiments, *Fast nuclear reactors, *Reactor design, *Space power reactors, Reactor technology, Zero power reactors.

For abstract, see STAR 10 19.

N72-28915 PC$10.50/MF$0.95
Laboratoire Dautomatique Et de Ses Applications Spatiales, Toulouse (France).
STUDY OF A SYSTEM FOR REGULATING TEMPERATURE IN A WEAK OSCILLATING BOUNDARY . ETUDE DUN SYSTEME DE REGULATION DE TEMPERATURE PAR TOUT OU RIEN A FAIBLE OSCILLATION LIMITE.
Ph.D. Thesis
H. Donnarel. 4 Feb 72, 170p

Descriptors: *Nuclear reactors, *Oscillations, *Temperature control, Heat transmission, Reactor technology, Systems engineering.

For abstract, see STAR 10 19.

18J. Reactor Materials

N72-30598 PC$4.00/MF$0.95
Gulf General Atomic, San Diego, Calif.
FABRICATION OF (U, ZR) C-FUELED/TUNGSTEN-CLAD SPECIMENS FOR IRRADIATION IN THE PLUM BROOK REACTOR FACILITY.
12 Jul 72, 39p NASA-CR-120945,
GULF-GA-A12121
Contracts NAS3-13471, PROJ. 6154

Descriptors: *Cladding, *Dimensional stability, *Irradiation, *Nuclear fuels, Carbides, Reactor technology, Tungsten.

For abstract, see STAR 10 21.

N72-30599 PC$6.25/MF$0.95
Techtran Corp., Glen Burnie, Md.
EXPERIMENTAL INVESTIGATION OF THE CREEP BUCKLING BEHAVIOR OF THIN WALLED PIPES MADE OF HEAT RESISTANT MATERIALS.
Ph.D. Thesis - Karlsruhe Univ.
H. Kaupa. Aug 72, 81p NASA-TT-F-14160
Contract NASW-2037
Tran- Transl. Into English of Experimentelle Untersuchung des Kriechbeulverhaltens Duennwandiger Rohre Aus Hochwarmfesten Werkstoffen Karlsruhe Univ., Nov. 1970 72 P

Descriptors: *Buckling, *Cladding, *Creep strength, *Nuclear fuel elements, *Pipes (tubes), *Thin walls, High temperature research, Mechanical properties, Pressure effects.

For abstract, see STAR 10 21.

18N. SNAP Technology

N72-28682 PC$6.50/MF$0.95
Battelle Memorial Inst., Columbus, Ohio.
ADAVANCED RTG AND THERMOELECTRIC MATERIALS STUDY.
Final Report, Jan. - Oct. 1971
P. E. Eggers. Nov 71, 86p NASA-CR-122431
Contract NAS5-11394

Descriptors: *Computer programs, *Power conditioning, *Temperature profiles, *Thermoelectric generators, Radioisotope batteries, Reactor design, Real time operation.

For abstract, see STAR 10 19.

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-750 304 PC$3.00/MF$0.95
Frankford Arsenal Philadelphia Pa
'FRONTAL PRESSURE'; AS A SECOND ARMING ENVIRONMENT FOR FUZES LAUNCHED FROM SMOOTH BORE BARRELS,
Richard S. Andrejkovics. 1972, 15p

Descriptors: (*Projectile fuzes, *Arming devices), Pressure, Aerodynamic loading, Orifices, Stagnation point, Exterior ballistics, Mathematical models, Experimental data.
Identifiers: Frontal pressure, Computer aided analysis, Computerized simulation.

Theoretical studies and empirical investigations presented in the report will prove that frontal pressure does exist, that this physical phenomena may well be one of the most reliable environments a projectile encounters from gun launch to the target, and that the use of this environment might solve the perplexing problem of satisfying MIL-STD-1316A for non-spin gun-launched ammunition. (Author)

AD-750 334 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
OSCILLATORY BEHAVIOR OF DETONATING SOLID EXPLOSIVES,
Philip M. Howe, and Giordano Melani. 1972, 13p

Descriptors: (*TNT, Detonation waves), Shock waves, Reaction kinetics, Detonations, Stability, Oscillation, Experimental data.
Identifiers: Solid explosives.

The report shows that the structural phenomenology of gaseous detonations is extendable to solid explosives of military interest. The cell size in gaseous detonations is a function of the effective heat release rate, i.e., that heat release rate experienced by the detonation front. This has been shown to be true for solids as well, and the cell size has been shown to be a function of the physical factors which affect the effective heat release rate, viz., granularity, loading density, confinement, charge dimensions, etc. (Author)

AD-750 352 PC$3.00/MF$0.95
Aberdeen Research and Development Center Aberdeen Proving Ground Md
OPTIMUM BALLET STUDY,
L. C. MacAllister, B. J. Reiter, B. B. Grollman, E. Roecker, and A. E. Thrailkill. 1972, 15p

Descriptors: (*Small arms ammunition, *Exterior ballistics), Aerodynamic characteristics, Aerodynamic loading, Drag, Magnus force, Projectile trajectories, Mathematical models, Terminal ballistics.

Identifiers: Computer aided analysis, Computer aided design, Design criteria.

The use of aerodynamic computations as a design basis for artillery shell is reasonably well established; however, the information generated had not been on shapes (or in sizes) of obvious interest to the small arms designer nor were the resultant studies in a useful framework for his purposes. Further work was needed to establish a base of confidence in computing the behavior of small arms projectiles and this should be done in bullet sizes and subject to typical small arms systems constraints. In an effort to provide this more general design basis, several programs were generated within the BRL and later partially supported by other agencies, particularly AMSAA and SASA. (Author)

AD-750 567 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
FLAME SPREADING IN SMALL ARMS BALL PROPELLANT,
Clarence W. Kitchens, Jr. Aug 72, 42p Rept no. BRL-1604

Descriptors: (*Ammunition propellants, *Flame propagation), Mathematical models, Partial differential equations, Heat transfer, Gas flow, Burning rate.
Identifiers: Method of characteristics, Hyperbolic differential equations.

The method of characteristics is used to obtain numerical solutions which described flame spreading in a bed of small arms ball propellant. The hyperbolic partial differential equations governing the gas flow include the effects of friction, convective heat transfer, area change and propellant burning. Numerical results are presented for the temperature, velocity and pressure distributions during flame spreading in a venting bomb. The accuracy of the numerical results is discussed by comparison with experimental pressure measurements taken in propellant firings and with finite-difference solutions obtained by other investigations. (Author)

AD-750 706 PC$3.00/MF$0.95
Cambridge Univ (England) Cavendish Lab
INITIATION OF EXPLOSIVES BY LOW STRENGTH SHOCKS.
Final technical rept.,
D. Tabor, J. E. Field, M. M. Chaudhri, W. L. Ng, and S. N. Heavens. Jun 72, 22p ARDG (E)-E-1452
Contract DAJA37-71-C-3273

Descriptors: (*Explosive materials, Detonations), PETN, TNT, RDX, Impact, Shock (Mechanics), Decomposition, Crystal structure, Great Britain.
Identifiers: Solid explosives.

The report describes a study of initiation processes involving weak (i.e. kbar strength) shocks. It has been shown that when an explosive crystal fractures decomposition occurs: a mass spectrometer is being used to determine whether the products produced are the same as in normal thermal decomposition. The impact behaviour of films of the secondary P.E.T.N., R.D.X. and T.N.T. has been investigated and it appears that plastic flow, melting and viscous heating occur in the final stages of the compression of P.E.T.N. and affect initiation. In the impact initiation of lead azide initiation is preceded by phenomena such as crack growth, crystal fragmentation and high-speed jetting. (Author)

AD-750 989 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
EFFECT OF IRON OXIDE ON COMBUSTION RATE OF MIXTURES WITH DIFFERENT PERCHLORATES,
V. I. Avdyunin, N. N. Bakhman, V. S. Nikiforov, A. E. Fogelzang, and Yu. S. Kichin. 16 Aug 72, 13p Rept no. FTD-HT-23-934-72
Edited trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Khimiya i Khimicheskaya Tekhnologiya (USSR) v14 n5 p666-670 1971, by M. Olaechea.

Descriptors: (*Ammonium perchlorate, *Combustion), (*Catalysts, Ammonium perchlorate), (*Iron oxides, Catalysts), Mixtures, Test methods, USSR.
Identifiers: Translations.

The authors have studied the catalystic effect of Fe2O3 on the combustion of mixtures of ammonium perchlorate with five different fuels and of certain mixtures with perchlorates of formamidine, potassium, and tetramethyl ammonium. In all cases the effectiveness of Fe2O3 decreases with an increase in the combustion rate of the original composition.

N72-28918 PC$3.25/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. Propulsion Div.
EVALUATION OF ELECTROEXPLOSIVE DEVICES BY NONDESTRUCTIVE TEST TECHNIQUES AND IMPULSIVE WAVEFORM FIRINGS.
V. J. Menichelli. 15 Jun 72, 25p NASA-CR-127451, JPL-TR-32-1556
Contract NAS7-100

Descriptors: *Initiators (explosives), *Nondestructive tests, *Quality control, Reliability engineering, Test equipment, Test facilities.

For abstract, see STAR 10 19.

N72-29954 PC$4.50/MF$0.95
Explosive Technology, Inc., Fairfield, Calif.
A STUDY OF AN ADVANCED CONFINED LINEAR ENERGY SOURCE.
M. C. Anderson, and W. B. Heidemann. 1971, 47p NASA-CR-112096
Contract NAS1-9984

Descriptors: *Deformation, *Detonation waves, *Explosives, *Pyrotechnics, Elastic properties, Energy conversion, Energy sources.

For abstract, see STAR 10 20.

N72-30770 PC$3.50/MF$0.95
Explosives Research and Development Establishment, Waltham Abbey (England).
COMPATIBILITY AND STABILITY TESTING OF EXPLOSIVES AND SOLID PROPELLANTS.
N. J. Blay, and I. Dunstan. Nov 70, 28p
ERDE-TR-45, BR23438
Conf- Presented At the Symp. on Res. on Mil. Explosives and Ammunition, Neth., 26 Sep. 1969

Descriptors: *Colloidal propellants, *Composite propellants, *Explosives, *Reliability analysis, *Stability tests, Aging (materials), Mechanical properties, Rubber, Solid rocket propellants, Storage stability, Thermal stability.

For abstract, see STAR 10 21.

19B. Bombs

AD-750 872 PC$3.00/MF$0.95
Air Force Armament Lab Eglin AFB Fla
WIND TUNNEL TESTS OF MODIFIED BLU-87/B FRAGMENTATION BOMBS.
Final rept. Mar-Apr 72,
Mark O. Schlegel. Jul 72, 35p Rept no. AFATL-TR-72-132

Descriptors: (*Fragmentation ammunition, Aerodynamic characteristics), Wind tunnel models, Bomb components, Nose cones, Configuration, Angle of attack, Bomb trajectories, Modification kits.
Identifiers: BLU-87/B bombs, Computer aided analysis, Munitions modification.

The report presents wind tunnel static and free oscillation aerodynamic data on the BLU-87/B fragmentation bomb for the standard and 11 modified configurations. The tests were conducted to obtain increased dispersion of the BLU-87/B bomb. The bomb was modified to obtain an S-shaped pitching-moment curve where the bomb trims at a non-zero angle angle of attack. This incidence produces a lift force which increases the amount of dispersion as compared to dispersion from ram air only. (Author)

19C. Combat Vehicles

AD-750 329 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
DEFORMATION AND FRACTURE OF TANK BOTTOM HULL PLATES SUBJECTED TO MINE BLAST,
Donald F. Haskell. 1972, 15p

Descriptors: (*Tanks (Combat vehicles), Blast), (*Armor plate, Blast), Deformation, Fracture (Mechanics), Land mines, Armored vehicles, Steel, Aluminum alloys, Mathematical analysis.
Identifiers: Aluminum alloy 5083.

Two equations were developed, one for deformation and one for fracture of flat rectangular simply supported plates subjected to blast attack from shallow-buried mines. These equations are found to be reasonably accurate for both aluminum and steel plates. Furthermore, the fracture equation yields predictions in good agreement with aluminum and steel armored vehicles damaged by mines in combat.

AD-750 355 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
A UNIFIED METHOD FOR DESCRIBING VEHICLE DYNAMICS,
N. R. Murphy, Jr., and A. S. Lessem. 1972, 12p

Descriptors: (*Tracked vehicles, Mobility), Terrain, Power spectra, Trafficability, Vibration, Human engineering, Numerical analysis.
Identifiers: Off road mobility.

An important factor in determining the off-road mobility of vehicles is vibration, but efforts to quantify vibration and its effects practically and expediently have been frustrated by the complexity of the problem. The vibration environment is the result of the interplay of several factors: mechanical structure of the vehicle, spectral content and roughness of the terrain, speed of traversal, and vibration tolerance of driver and occupants. The report describes a method for characterizing vehicle dynamics in a direct, graphic way. The method is described in summary form to convey an overview. Circumstances in which the method can be of service to vehicle designers and analysts, and the several technical factors bearing on its organization and implementation are given.

19D. Explosions, Ballistics, and Armor

AD-750 340 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
MOMENTUM TRANSFER FROM EXPLOSION-DRIVEN SHOCK WAVES TO TREE STEMS,
M. P. Keown, H. Nikodem, and J. K. Stoll. 1972, 15p

Descriptors: (*Area bombing, *Trees), (*Tactical air support, *Aircraft landings), Helicopters, Explosion effects, Terminal ballistics, Detonation waves, Demolition, Area coverage, Damage assessment, Mathematical models.
Identifiers: Landing zones, Abscission (Botany), Defoliation, Computer aided analysis.

The successful and efficient utilization of bombs for clearing HLZ's can be greatly enhanced by the use of techniques for predicting the dimensions of clearings that can be obtained with various bomb yields in various kinds of forests. The output of an analytical solution that is to be useful in comparing explosive clearing devices during the design stage or in evaluating the effectiveness of a given device in a given forest environment must include tree remnant height with respect to horizontal distance from the explosion center. Analytical techniques for predicting tree stem failure as a function of wood strength properties, stem diameter, and shock wave (front) characteristics are presented. (Author)

AD-750 373 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
ANALYSIS OF BAND PRESSURE IN A GUN TUBE USING FINITE ELEMENTS AND SHELL PUSHING DATA,
Stephen G. Sawyer, and John M. Hurban. 1972, 14p

Descriptors: (*Rotating bands, Pressure), (*Gun barrels, Interior ballistics), Obturation (Ballistics), Shear stresses, Projectiles, Strain (Mechanics), Friction, Strain gages, Test methods.
Identifiers: Finite element analysis.

In the report, effective band pressures are calculated from data obtained through shell-pushing experiments in conjunction with the finite element method of stress analysis for the two-independent variable cases. The finite element technique takes into account the irregular geometry of the gun tube. However, the effect of gun tube rifling and the missile groove are neglected. In addition, the band pressure and shear stress are assumed to be uniform. (Author)

AD-750 379 PC$3.00/MF$0.95
Frankford Arsenal Philadelphia Pa
AN ANALYSIS OF 5.56MM ALUMINUM CARTRIDGE CASE BURN-THROUGH PHENOMENON.
Walter H. Squire, and Reed E. Donnard. 1972, 15p

Descriptors: (*Cartridge cases, *Burnthrough), Small arms ammunition, Aluminum, Heat transfer, Gas flow, Orifices, Interior ballistics.

This work was aimed at understanding the 'burn-through' problem that has impeded orderly engineering development and application of aluminum alloy cartridge cases in high-performance ammunition since the 1890's. It has been shown that a gas path through the wall of an aluminum case, and through which propellant gas can flow during the internal ballistic cycle, is a precursor to the 'burn-through' phenomenon. Solutions to this problem have been found that either prevent propellent gas flow through a path in the case that develops unintentionally during firing of the ammunition, or alter the effect of propellant gas flow through such a gas path. Since an engineering understanding of the 'burn-through' phenomenon is available, work is currently underway to demonstrate the feasibility of aluminum cartridge cases.

AD-750 564 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
DETERMINATION OF AERODYNAMIC DRAG FROM RADAR DATA.
Memorandum rept.,
Robert F. Lieske, and Antoinette M. MacKenzie. Aug 72, 26p Rept no. BRL-MR-2210

Descriptors: (*Projectile trajectories, *Radar tracking), (*Projectiles, Drag), Aerodynamic characteristics, Range tables, Impact prediction, Howitzers, Coriolis effect, Acceleration, Exterior ballistics.
Identifiers: M-107 projectiles (155-MM), Point position radar.

A method for utilizing point position radar data to determine the aerodynamic drag of a projectile is described. Proof of the method's validity and feasibility is represented by results obtained with flight test data taken for a range firing of the 155mm howitzer with the M107 projectile. (Author)

AD-750 976 Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
EXPANSION AND CONTRACTION OF PLANAR, CYLINDRICAL, AND SPHERICAL UNDERWATER GAS BUBBLES,
Joseph B. Keller, and David Epstein. 13 Dec 71, 8p Rept no. NYU-ONR-H38
Contract N00014-67-A-0467-0006
Prepared in cooperation with State Univ. of New York, Bronx. Maritime Coll.
Availability: Pub. in The Jnl. of the Acoustical Society of America, v52 n3 pt2 p975-980 1972.

Descriptors: (*Explosion bubbles, Oscillation), Underwater explosions, Exploding wires, Detonating cord, Damping, Differential equations, Integral equations, Numerical analysis.
Identifiers: Wave equations.

The one-dimensional motion of a planar gas bubble, the axially symmetric motion of a cylindrical bubble, and the spherically symmetric motion of a spherical bubble in a liquid are considered. (Author)

N72-28929 PC$4.75/MF$0.95
Ernst-mach-inst., Freiburg (West Germany).
MICROSTRUCTURE OF GASEOUS DETONATION WAVES . MIKROSTRUKTUR DER DETONATIONSWELLEN IN GASEN.
F. Schultz-grunow. Aug 71, 51p REPT-6/71

Descriptors: *Detonation waves, *Gas explosions, *Mathematical models, *Spherical waves, Dimensional analysis, Photographic measurement, Pressure distribution, Schlieren photography, Temperature distribution, Wave fronts.

For abstract, see STAR 10 19.

19E. Fire Control and Bombing Systems

AD-750 333 PC$3.00/MF$0.95
Human Engineering Labs Aberdeen Proving Ground Md
HUMAN ENGINEERING LABORATORY BATTALION ARTILLERY TESTS (HELBAT),
Gary L. Horley. 1972, 15p

Descriptors: (*Artillery fire, Accuracy), (*Weapon systems, Army personnel), Army training, Test methods, Human engineering, Errors, Fire control systems, Range finding, Artillery units.
Identifiers: HELBAT (Human Engineering Laboratory Battalion Artillery Tests), Human engineering laboratory battalion artillery tests, M-109 howitzers (155-mm).

The Human Engineering Laboratory (HEL) has begun to develop the information through a series of field experiments superimposed onto Operational Readiness Tests (ORT) which Army units must undergo each year. Two of these field experiments, under the title of Human Engineering Laboratory Battalion Artillery Test (HELBAT), have already been completed and a third HELBAT has just been conducted. The artillery studies are scaled to battalion size. The battalion is the Artillery's basic operational unit and thus provides the greatest realism for operational study. (Author)

AD-750 384 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
IMPROVED SOUND RANGING LOCATION OF ENEMY ARTILLERY,
Donald M. Swingle, Craig M. Crenshaw, and Raymond Bellucci. 1972, 15p

Descriptors: (*Artillery fire, *Sound ranging), Microphones, Deployment, Sound signals, Meteorological parameters, Circular error probable, Analysis of variance.

The applied research described has been basically directed toward developing improved meteorological techniques for use with tactical sound ranging systems. In the course of these studies it became apparent that significant error was being injected into the locations found using the standard GR-8 Sound Ranging System by the solution technique which transforms the relative times of arrival of sound at six microphones into an estimate of spatial location. A number of candidate techniques were evaluated. (Author)

19F. Guns

AD-750 337 PC$3.00/MF$0.95
Army Weapons Command Rock Island Ill
DEVELOPMENT OF A DYNAMIC MODEL FOR AN AIRCRAFT GUN TURRET SYSTEM,
Tonney H. M. Hung, James T. Wong, and Philip E. Townsend. 1972, 12p

Descriptors: (*Gun turrets, Design), (*Helicopters, Gun turrets), Mathematical models, Configuration, Aircraft turrets, Cyclic rate, Recoil mechanisms, Gun components, Equations of motion.
Identifiers: H-1 aircraft, AH-1G aircraft, Huey Cobra, Helicopter gunships, M-120 gun turrets, XM-120 gun turrets.

In this paper the effort of model structuring and formulation phases for developing a dynamic model of a conceptual helicopter gun-turret system are reported. The basic system configuration for this modeling resembles the XM120 gun-turret system related to AH-1G attack helicopter. The level of modeling for the gun-turret dynamics is intended for that of preliminary design and its related evaluations. (Author)

AD-750 357 PC$3.00/MF$0.95
Army Weapons Command Rock Island Ill
DEVELOPMENT AND VALIDATION OF MATHEMATICAL MODELS OF HOWITZER, MEDIUM, TOWED: 155MM, XM198,
Michael C. Nerdahl, and Jerry W. Frantz. 1972, 15p

Descriptors: (*Howitzers, Mathematical models), Equations of motion, Recoil mechanisms, Design.
Identifiers: M-198 howitzers (155-MM), XM-198 howitzeRS (155-MM), Three degrees of freedom, Degrees of freedom.

The engineers and analysts responsible for development of the XM198 Howitzer have effectively used these mathematical models as a design tool. This use has shortened the time required for design evaluation, provided a satisfactory data base for component design, and allowed for study of weapons response under various firing conditions. The importance of several parameters, varying from location of ground support points to secondary paths for fluid flow, has been identified and a quantitative definition of significance has been obtained from those sensitivity studies which have been completed.

N72-28538 PC$3.00/MF$0.95
Metaalinstituut TNO, Delft (Netherlands).
EXAMINATION OF TWO 25 POUND GUN BARRELS . ONDERZOEK VAN TWEE 25 PND. SCHIETUIZEN.
T. P. Regenboog. 4 May 71, 19p
M71/07/38-REG/VVE

Descriptors: *Barrels, *Expansion, *Guns (ordnance), *Metallurgy, Hardness tests, Mechanical properties, Microstructure, Plastic properties.

For abstract, see STAR 10 19.

19G. Rockets

AD-750 796 PC$3.00/MF$0.95
Space Data Corp Phoenix Ariz
DESIGN, DEVELOPMENT AND FLIGHT TEST OF THE SUPER LOKI DART METEOROLOGICAL ROCKET SYSTEMS.
Final rept. 1 Feb 69-30 May 72,
Bruce Bollermann, and Robert L. Walker. 30 May 72, 236p AFCRL-72-0382
Contract F19628-69-C-0212

Descriptors: (*Meteorological parameters, *Upper atmosphere), (*Sounding rockets, Payload), Instrumentation, Rocket launchers, Guided missile ranges, Descent trajectories, Transponders, Atmospheric temperature, Flight testing.
Identifiers: Loki, Loki Dart Sounding rockets, Super Loki Dart sounding rockets, Starutes.

The Super Loki Dart Meteorological Rocket Systems have been developed to obtain high altitude temperature, density and wind measurements by means of small inexpensive rocket systems. The Super Loki Robin Dart System was designed as a replacement for the larger and more expensive Viper Robin Dart to obtain falling sphere density and wind data from an altitude of 30 km to 90 km. The Super Loki Transponder Dart was also developed in order to offer better wind and temperature data from 25 km to a higher altitude, 70 km, than the more expensive Arcas Transponder system. The Super Loki Transmitter Dart was developed as a candidate to replace the Loki Dart by also offering improved data to higher altitudes. (Author)

N72-28887 PC$3.75/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
COMPILATION OF WEIGHTS, BALANCE, CG, AND MOMENTS OF INERTIA FOR SOUNDING ROCKET PAYLOADS.
J. J. Wolff, Jr., and J. F. Fitz. Jul 72, 35p
NASA-TM-X-65966, X-743-72-257

Descriptors: *Payloads, *Rocket flight, *Rocket nose cones, *Sounding rockets, Equipment specifications, Rocket engine cases, Rocket-borne instruments.

For abstract, see STAR 10 19.

20. PHYSICS

20A. Acoustics

AD-750 649 PC$3.00/MF$0.95
Human Engineering Labs Aberdeen Proving Ground Md
MATERIEL DESIGN STANDARD FOR NOISE LEVELS OF ARMY MATERIEL COMMAND EQUIPMENT,
Georges R. Garinther, and David C. Hodge. Sep 72, 29p Rept no. HEL-Standard-S-1-63C
Supersedes AD-632 913.

Descriptors: (*Noise, *Standards), (*Army equipment, Noise), Human engineering, Hazards, Vehicles, Airplane noise, Acoustic impedance, Sound transmission, Instrumentation, Engine noise, Hearing, Measurement.
Identifiers: Design standards, *Noise pollution, *Noise levels, *Acoustic measurement.

HEL Standard S-1-63C is the U. S. Army Materiel Command's design standard for noise. It establishes the acoustical noise levels permitted in and around all equipment designed, developed and procured by AMC, and specifies the testing requirements and measurement techniques for determining conformance to the noise limits. Adherence to the provisions of this standard should assure compliance with TB Med 251. The noise levels and test procedures of this standard are intended to cover typical operational conditions and are based on considerations of hazard to hearing, speech intelligibility, aural detection and appropriate state and federal noise limits. (Author)

AD-750 693 PC$3.00/MF$0.95
Naval Ordnance Lab White Oak Md
THE DEPTH PROFILE OF AMBIENT NOISE IN THE DEEP SEA NORTH OF ST. CROIX, VIRGIN ISLANDS,
R. J. Urick, G. R. Lund, and T. J. Tulko. 14 Aug 72, 30p Rept no. NOLTR-72-176

Descriptors: (*Underwater sound, Noise), Caribbean Sea, Deep water, Background, Power spectra.
Identifiers: *Underwater ambient noise, Marlin project.

The deep sea appears to be quieter at mid-depth than at greater or lesser depths. This was found in a series of measurements of the ambient noise background at a location north of St. Croix, V.I., using hydrophones suspended from a cable at intervals of 2000 feet down to 8100 feet. The noise profiles show a sharp decrease of noise from the surface down to 6100 ft and a reversal of the profile below. The measurement site is an active, dynamic one, and shows a large variability in noise level from hour to hour. (Author)

AD-750 754 PC$3.00/MF$0.95
Saclant ASW Research Centre La Spezia (Italy)
ACOUSTIC SCATTERING BY OBJECTS WHOSE SHAPES PERMIT SEPARATION OF VARIABLES.
Technical memo.,
Vetle R. Lauvestad. 1 Sep 72, 33p Rept no. SACLANTCEN-TM-180
NATO Furnished

Descriptors: (*Sound transmission, Scattering), (*Sonar signals, Spectrum signatures), Antisubmarine warfare, Target recognition, Spheres, Mathematical models, Italy.
Identifiers: Acoustic scattering.

Descriptions of the field scattered by finite objects in the presence of a radiating acoustic source are among the investigations fundamental to antisubmarine warfare, but progress from idealised tractable models to more realistic 'target' shapes is a slow business of great theoretical difficulty, leaving aside the complications introduced by the properties of the medium. In this paper a selective review of existing treatments is first briefly and critically made. Then, because of the insight that generalisations may give, a general treatment is formulated of the acoustic scattering problem that includes the whole class of cases in which the Helmoltz's equation separates and partial wave analysis is applicable. Care is taken to indicate the practical shortcomings of the class of solutions that this exact treatment provides. Possible means by which some of these shortcomings might be overcome are indicated. (Author)

AD-750 766 PC$3.00/MF$0.95
California Univ Los Angeles School of Engineering and Applied Science
ON THE SCATTERING OF WAVES BY PENETRABLE OBJECTS.
Semiannual rept. 1 Feb-1 Sep 72,
C. Yeh. Sep 72, 7p Rept no. UCLA-ENG-7286
Contract N00014-69-A-0200-4026

Descriptors: (*Sound, Focusing), (*Lenses, Acoustic equipment), (*Waveguides, Acoustic equipment), Sound transmission, Scattering.
Identifiers: *Acoustic lenses, *Acoustic waveguides.

The document is a semiannual progress report on the research activities in scattering of waves by penetrable objects. Progress on the following two problems is reported: (1) Solid lenses and (2) Microsound Elastic waveguides. (Author)

AD-750 974 Reprint
Rensselaer Polytechnic Inst Troy N Y Dept of Mathematics
SOUND TRANSMISSION IN AN ISOSPEED OCEAN CHANNEL WITH DEPTH-DEPENDENT CURRENT,
M. J. Jacobson, and L. A. Stallworth. 6 Aug 71, 17p Rept no. RPI-Math-98
Contract N00014-67-A-0117-0002
Prepared in cooperation with Naval Underwater Systems Center, New London Lab. Conn.
Pub. in Jnl. of the Acoustical Society of America, v51 n5 pt2 p1738-1750 1972.

Descriptors: (*Underwater sound, Sound transmission), Sonar signals, Refraction, Surfaces, Reflection, Ocean currents, Naval research, Theses.
Identifiers: Ray tracing.

A constant sound-speed (isospeed) channel with horizontal boundaries and a current of constant direction and linear depth-dependent magnitude is considered. Ray paths are closely approximated by connected circular helical arcs. Expressions for the travel time and spreading loss of individual arrivals are found when necessary and sufficient conditions for the ray paths to be plane are satisfied. For a bottom-mounted source and receiver, it is shown that a current gradient can significantly affect the ray geometry, travel time, and spreading loss of each arrival. The total field for a 33-kmX40-m channel is calculated. It is found that small changes in the current gradient can produce large variations in the amplitude and phase of the field including the amplitude fade-phase offset phenomenon. (Author)

N72-28010 PC$3.50/MF$0.95
Hydrospace Research Corp., San Diego, Calif.
NOISE MEASUREMENTS OBTAINED DURING VISUAL APPROACH MONITOR EVALUATION IN 747 AIRCRAFT.
C. S. Tanner, and R. E. Glass. May 72, 27p
NASA-CR-114478, HRC-TR-S-213
Contract NAS2-6490

Descriptors: *Aircraft noise, *Approach control, *Boeing 747 aircraft, *Noise reduction, *Visual control, Acoustic measurements, Meteorological parameters, Radar tracking.

For abstract, see STAR 10 19.

N72-28014 PC$3.00/MF$0.95
Defence and Civil Inst. of Environmental Medicine, Downsview (Ontario). Behavioural Sciences Div.
THE EFFECTIVENESS OF TWO TYPES OF INSULATION IN THE CHSS-2 HELICOPTER.
S. E. Forshaw, and R. A. Stong. Mar 72, 15p
DCIEM-839

Descriptors: *Aerodynamic noise, *Helicopters, *Human factors engineering, *Noise intensity, *Noise reduction, Acoustic attenuation, Acoustic measurements, Insulation.

For abstract, see STAR 10 19.

N72-29287 PC$5.00/MF$0.95
North Carolina State Univ., Raleigh. Center for Acoustical Studies.
DEVELOPMENT AND EVALUATION OF A DEVICE TO SIMULATE A SONIC BOOM.
L. C. Rash, R. F. Barrett, and F. D. Hart. May 72, 58p NASA-CR-112117
Contract NGL-34-002-095

Descriptors: *Acoustic properties, *Simulators, *Sonic booms, *Vibrational spectra, Acoustic simulation, Diaphragms (mechanics), Energy spectra, Pressure.

For abstract, see STAR 10 20.

N72-30000 PC$15.50/MF$0.95
General Electric Co., Evendale, Ohio. Aircraft Engine Group.
FLIGHT VELOCITY INFLUENCE ON JET NOISE OF CONICAL EJECTOR, ANNULAR PLUG AND SEGMENTED SUPPRESSOR NOZZLES.
J. F. Brausch. Aug 72, 268p NASA-CR-120961
Contract NAS3-15773

Descriptors: *Acoustic measurements, *Aerodynamic noise, *Flight tests, *Jet aircraft noise, Conical nozzles, F-106 aircraft, Nozzle flow, Suppressors.

For abstract, see STAR 10 21.

N72-30011 PC$3.00/MF$0.95
Tracor, Inc., Austin, Tex.
COMMUNITY REACTION TO AIRCRAFT NOISE AROUND SMALLER CITY AIRPORTS.
W. K. Conner, and H. P. Patterson. Aug 72, 187p NASA-CR-2104
Contract NAS1-10216

Descriptors: *Aircraft noise, *Human reactions, *Nevada, *Tennessee, Airports, Communities, Noise pollution.

For abstract, see STAR 10 21.

N72-30607 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EMISSION OF SOUND FROM AXISYMMETRIC TURBULENCE CONVECTED BY A MEAN FLOW WITH APPLICATION TO JET NOISE.
M. E. Goldstein, and B. M. Rosenbaum. Sep 72, 42p NASA-TN-D-6939, E-6844

Descriptors: *Aerodynamic noise, *Axisymmetric flow, *Jet flow, *Lighthill gas model, *Turbulent flow, Jet aircraft noise, Mathematical models, Shear flow.

For abstract, see STAR 10 21.

N72-30608 PC$3.00/MF$0.95
Southampton Univ. (England). Inst. of Sound and Vibration Research.
THE ACOUSTICS OF FLOW DUCTS.
P. E. Doak. 29 Feb 72, 14p ISVR-TR-55
Conf- Conf. Held in Southampton, Engl., 11-14 Jan. 1972

Descriptors: *Acoustic attenuation, *Acoustic streaming, *Ducts, *Sound propagation, Acoustic impedance, Ducted flow, Flow characteristics.

For abstract, see STAR 10 21.

PB-212 449 PC$3.00/MF$0.95
Transport and Road Research Lab., Crowthorne (England).
A DATA LOGGING SYSTEM FOR THE MEASUREMENT OF ROAD TRAFFIC NOISE,
M. Cheeseman, and P. M. Nelson. 1972, 21p TRRL-LR-479

Descriptors: (*Noise, Data acquisition), (*Vehicular traffic, Noise), Microphones, Magnetic recording, Tape recording, Sound recording, Acoustic measurement, Great Britain.
Identifiers: Computer aided analysis, *Traffic noise, *Noise pollution.

The TRRL noise logging equipment is a ten microphone system designed to accumulate information automatically about the temporal distribution of noise over a selected area. It is capable of operating continuously for 24 hours or more. The report describes the components of the logger and discusses its performance in the field. The accuracy of the system depends upon the rate of data acquisition. At the rate currently in use, the standard error associated with estimates of the L10 and L90 indices is typically plus or minus 1.0 dBA at sites alongside roads. This compares favourably with the precision offered by the more widely used tape recording method. The results of an experiment carried out in Birmingham are reported. (Author)

20B. Crystallography

AD-750 601 PC$3.00/MF$0.95
Army Materials and Mechanics Research Center Watertown Mass
PTDS2, A PROGRAM FOR CALCULATING THE THERMAL DIFFUSE SCATTERING IN INTEGRATED INTENSITIES OF POWDER PATTERN REFLECTIONS.
Technical rept.,
Christopher B. Walker, and David R. Chipman. Jul 72, 21p Rept no. AMMRC-TR-72-27

Descriptors: (*Diffraction analysis, *Computer programs), Crystal structure, X-ray diffraction analysis, Phonons, Anisotropy, Instruction manuals, Corrections.
Identifiers: FORTRAN 4 programming language, FORTRAN, PTDS2 computer program, Thermal diffuse scattering, UNIVAC 1108 computers, CDC 6400 computers.

The report describes a FORTRAN computer program to calculate the correction for one-phonon thermal diffuse scattering included in the measured integrated intensity of a powder pattern reflection from a monatomic cubic material. The method improves on previous approaches by employing a correct description of the frequencies and polarization vectors of the important long-wavelength phonons for materials of arbitrary elastic anisotropy. Detailed instructions are given for using the program, together with a complete listing. (Author)

AD-750 602 PC$3.00/MF$0.95
Army Materials and Mechanics Research Center Watertown Mass
PTDS3, A PROGRAM FOR CALCULATING THE THERMAL DIFFUSE SCATTERING IN INTEGRATED INTENSITIES OF POWDER PATTERN REFLECTIONS,
Christopher B. Walker, and David R. Chipman. Jul 72, 15p Rept no. AMMRC-TR-72-28

Descriptors: (*Diffraction analysis, *Computer programs), Crystal structure, X-ray diffraction analysis, Phonons, Instruction manuals, Corrections.
Identifiers: FORTRAN 4 programming language, FORTRAN, PTDS3 computer program, Thermal diffuse scattering, CDC 6400 computers.

The report describes a FORTRAN computer program to calculate the correction for one-phonon thermal diffuse scattering included in the measured integrated intensity of a powder pattern reflection from a monatomic cubic material. The method, based on a modified Warren model, requires very little computation time and gives reasonably accurate results under most conditions even for very anisotropic materials. Detailed instructions are given for using the programs, together with a complete listing. (Author)

AD-750 654 PC$3.00/MF$0.95
Office of Naval Research London (England)
CRYSTAL GROWTH FROM THE VAPOR PHASE AND EPITAXY: AN INTERNATIONAL CONFERENCE HELD IN JERUSALEM, 21-25 MAY 1972.
Conference rept.,
Immanuel Estermann. 7 Sep 72, 25p Rept no. ONRL-C-13-72

Descriptors: (*Crystal growth, Symposia), Epitaxial growth, Vapor plating, Sputtering, Semiconducting films, Israel.
Identifiers: Chemical vapor deposition, Thin films.

The main topic of the Conference was the relationship of scientific progress to industrial application in the semiconductor and microelectronics fields. Subjects discussed included material transport, nucleation, and crystal growth, especially in their relation to the production of epitaxial films for use in electronic devices. One of the newer techniques presented was liquid phase epitaxy in which the epitaxial layer is precipitated from a supersaturated or supercooled solution on a crystalline substrate. Properties of various epitaxial films and methods for their evaluation were another subject for discussion. (Author)

AD-750 833 Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
FURTHER COMMENTS ON THE PAPER 'ON THE INTERPRETATION OF ELECTRON DIFFRACTION PATTERNS FROM 'AMORPHOUS' BORON,
H. M. Otte, H. A. Lipsitt, P. F. Lindquist, M. L. Hammond, and R. H. Bragg. 9 Jan 67, 5p ARL-67-0248
Availability: Pub. in the Physica Status Solidi, v19 pK99-K101 1967.

Descriptors: (*Boron, Crystal structure), Electron diffraction analysis, Vapor plating, Corrections.
Identifiers: Amorphous materials, Face centered cubic lattices, Hexagonal close packed lattices.

AD-750 941 PC$3.00/MF$0.95
Tyco Labs Inc Waltham Mass
THM GROWTH OF MATERIALS FOR ELECTRO-OPTIC LIGHT MODULATORS.
Final rept. 15 Jul 71-14 Jul 72,
Fritz v. Wald, John C. Swartz, and Andrew A. Menna. Sep 72, 29p Rept no. C-203 AFCRL-72-0536
Contract F19628-72-C-0011, ARPA Order-1434

Descriptors: (*Crystal growth, *Electrooptics), Cadmium compounds, Germanium compounds, Tin compounds, Arsenides, Modulators.
Identifiers: Elecrooptic modulators, Traveling heater method, Proustite, Cadmium arsenides, Tin arsenides, Germanium arsenides.

The report summarizes the year's work in growth of crystals of electrooptic materials from a solvent zone (a growth method designated THM). Single crystals of proustite (Ag3AsS3) and a crystal of Bi (12)TiO (20) were achieved. Extensive effort on growth of CdSnAs2 from Sn and CdGeAs2 from Pb zones did not yield useful-sized crystals even after significant improvements in the THM arrangement. Investigations of the phase equilibria determined that in each case a phase other than the desired ternary arsenide was on the verge of crystallizing from the solvent zone. Also, it was deduced that constitutional supercooling occurred in the diffusion boundary layer of the THM runs on both systems. The contrasting results on proustite and the II-IV-V2 compounds are attributed to different degrees of supercooling due to differences of molecular association in the liquid phase. (Author)

AD-750 966 PC$3.50/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
REAL STRUCTURE STUDIES ON A (III)B (V) SEMICONDUCTOR CRYSTALS,
W. Schmidt. 31 Aug 72, 31p Rept no. FTD-HC-23-0705-72
Edited trans. of Leipzig U. Wissenschaftliche Zeitschrift. Mathematisch-Naturwissenschaftliche Reihe (East Germany) v20 n1 p73-92 1971.

Descriptors: (*Semiconductors, Crystal structure), Dislocations, Deformation, Twinning (Crystallography), Grain boundaries, Impurities, Gallium arsenides, Indium compounds, Phosphides, Electron diffraction analysis, X-ray diffraction analysis, East Germany.
Identifiers: Translations, Gallium phosphides, Indium phosphides.

The paper reviews experimental methods for the study of semiconductor crystals, and particularly crystals of A (III)B (V) semiconducting compounds. Various types of crystal disorders are discussed. (Author)

20C. Electricity and Magnetism

AD-750 617 PC$3.00/MF$0.95
Princeton Univ N J
THE PRINCETON PENNSYLVANIA ARMY AVIONICS RESEARCH PROGRAM. A FUNDAMENTAL STUDY OF STATIC ELECTRIC PHENOMENA (APPLIED TO HELICOPTERS).
Final task rept. 1 Sep 66-30 Dec 71,
G. J. Born, W. F. Burke, and E. J. Durbin. Mar 72, 77p ECOM-02412-10
Contract DA-28-043-AMC-02412 (E)

Descriptors: (*Static electricity, *Electric discharges), (*Helicopters, Electrostatic fields), Aviation safety, Electric fields, Electric insulation, Voltage, Resistance (Electrical), Helicopter hoists, Ground (Electrical).
Identifiers: Corona discharges.

In the report is given a summary of the charging and discharging processes of a helicopter in flight. Emphasis is placed upon obtaining approximations for estimating the magnitude of the problem for given environmental conditions. The problems of electrostatic charging and discharging of helicopters with regard to safety of personnel, cargo and radio frequency interference are stated. Acceptable safety limits for personnel protection and safe cargo handling are presented. A solution to the cargo hook up problems of electrostatic charged helicopters is proposed, using current technology. A summary is given of the construction and test results of this safe-cargo hook up system. The Appendixes summarizes work on corona discharges, space charges, and environmental effects on charging and discharging phenomena. (Author)

AD-750 658 PC$3.00/MF$0.95
Cornell Univ Ithaca N Y Lab of Plasma Studies
BREAKDOWN OF MAGNETIC INSULATION DUE TO DIAMAGNETISM.
Topical research rept.,
Isaiah Nebenzahl. Jul 71, 23p Rept no. LPS-76
Contract N00014-67-A-0077-0002

Descriptors: (*Electron beams, Particle trajectories), Electron density, Equations of motion, Magnetic fields, Space charges, Electrostatics.
Identifiers: Diamagnetism, *Electron gas.

A magnetic field can act as an insulator by inhibiting the electrons from transversing a gap between two metallic plates. It is here shown that, if electrons are produced at a high enough rate on the surface of the negative plate, breakdown will occur. The 'critical' current density is given by an equation; or, if the current is space-charge limited, by another equation. The calculation here reported is non-relativistic, i.e. (H sub 0) >> (E sub 0) is assumed.

AD-750 699 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
ELECTRICAL BREAKDOWN OF DIELECTRICS WITH A DIPOLE STRUCTURE,
N. A. Prikhodko. 20 Jul 72, 13p Rept no. FTD-HC-23-1176-72
Unedited rough draft trans. of Sibirskii Fiziko-Tekhicheskii Institut. Trudy (USSR) v6 n2 p114-119 1945.

Descriptors: (*Dielectric properties, *Liquids), Failure (Electronics), Water, Glycerols, Quartz, USSR.
Identifiers: Translations, *Dielectric breakdown.

On the basis of data obtained in the breakdown of water and glycerine, as a function of the variation of the temperature, and also from data concerning breakdown voltages for ice, Seignette salt, and polar liquids, it follows that with the variation of the dielectric constant of the matter its breakdown voltage also changes. The variation of the breakdown voltage of a dielectric may be explained by the variation of the internal field. It is demonstrated that in sharply heterogeneous fields liquids having large dipole moments have a considerably decreased electric strength in comparison with nonpolar liquid. During breakdown in pulsed voltage dielectrics with a dipole structure show a temperature dependence of the breakdown voltage. (Author)

N72-29683 PC$3.50/MF$0.95
Department of Energy, Mines and Resources, Ottawa (Ontario).
ANALYSIS OF UNITS IN ELECTROMAGNETISM.
F. Primdahl. 1971, 26p R-23
Rean- Repr. From Earth Phys. Branch, V. 42, No. 1

Descriptors: *Electromagnetism, *Units of measurement, Magnetic fields, Magnetic moments, Quantitative analysis, Theories.

For abstract, see STAR 10 20.

20D. Fluid Mechanics

AD-750 398 PC$3.00/MF$0.95
Virginia Polytechnic Inst and State Univ Blacksburg Dept of Engineering Mechanics
NUMERICAL INVESTIGATION OF UNSTEADY BOUNDARY-LAYER SEPARATION,
D. P. Telionis, D. Th. Tsahalis, and M. J. Werle. Sep 72, 33p Rept no. VPI-E-72-14
Contract N00014-70-C-0024, Grant NSF-GK-32622
Prepared in cooperation with Cincinnati Univ., Ohio.

Descriptors: (*Laminar boundary layer, *Flow separation), (*Flow fields, Numerical analysis), Skin friction, Velocity, Equations of motion, Curve fitting.
Identifiers: Unsteady flow.

It has been previously indicated both theoretically and experimentally that for steady flow over moving boundaries, the vanishing of skin friction does not mean separation and that separation occurs at a station where the generalized Moore-Rott-Sears (MRS) criterion is satisfied. The authors have earlier indicated numerically that the Goldstein-type separation-singularity appears at the point where the MRS criterion is satisfied. In the present paper and in accordance with the theoretical work of Sears and one of the authors, this idea is extended to unsteady flows. A Goldstein-type of a traveling singularity is discovered and interpreted as 'unsteady boundary-layer separation.' The features of the flow in the neighborhood of this singularity are investigated. (Author)

AD-750 500 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
VELOCITY AND ENERGY OF AN ABRASIVE PARTICLE IN CAVITATION LIQUID,
B. A. Agranat, V. I. Bashkirov, V. A. Dokuchaeva, and A. P. Chernov. 11 Aug 72, 18p Rept no. FTD-MT-24-292-72
Edited machine trans. of Ultrazvukovye Metody Intensifikats i Tekhnologicheskikh Protsessov (USSR) n60 p43-53 1970, by Robert D. Hill.

Descriptors: (*Cavitation, *Abrasives), Particles, Kinetic energy, Equations of motion, Problem solving, Mathematical models, Fluid dynamic properties, Programming (Computers), USSR.
Identifiers: Cavitation liquids, Translations.

The kinetic energy of abrasive particles of various sizes was determined at which particles are knocked out from a metal surface during an impact. The shock wave arises during secondary extension of a cavitation cavity. The absolute velocity in the compression of the cavity can be determined by solving the equations for the motion of a vapor gas bubble in a sonic field on a computer. It is assumed that the vapor behaves in a compression like an ideal gas. (Author)

AD-750 522 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THREE-DIMENSIONAL SUPERSONIC DETACHED CURRENTS IN FLOWING PAST SOLID AND GASEOUS BARRIERS WITH A SUPERSONIC STREAM,
A. N. Zubkov, Yu. A. Nanov, A. M. Voitenko, and A. I. Glagolev. 17 Aug 72, 11p Rept no. FTD-HT-23-349-72
Edited trans. from Teplo-i Massoperenos (USSR) p69-72 1969, by Bernard L. Tauber.

Descriptors: (*Flow separation, Supersonic characteristics), Boundary layer, Model tests, Analog systems, Cylindrical bodies, Three-dimensional flow, Shock waves, USSR, Flat plate models.
Identifiers: Translations, Detached flow, Cylindrical barriers, Gaseous barriers.

Results are presented of the investigation of supersonic flow past solid cylindrical and jet (circular jet) barriers on a plate. It is shown that absence before the jet of a region of very low pressure leads, at identical dimensions of the met and equivalent solid, to absence before the jet of local supersonic zones. (Author)

AD-750 536 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE THEORY OF THE CRITICAL CONDITIONS OF A GAS EJECTOR AT LARGE PRESSURE DROPS,
V. N. Gusev. 28 Jul 72, 15p Rept no. FTD-MT-24-0005-72
Edited machine trans. of Tsentralnyi Aerogidrodinamicheskii Institut. Uchenye Zapiski (USSR) v1 n3 p91-96 1970, by Robert Allen Potts.

Descriptors: (*Jet mixing flow, Pressure), Air ejectors, Transonic flow, Shock waves, Numerical analysis, USSR.
Identifiers: Translations.

The critical operating conditions of an ejector with a cylindrical mixing chamber are analyzed within the framework of ideal-gas dynamics. Jet flows, overexpanded with respect to the static pressure of a low-pressure gas, are calculated on the basis of supersonic compressed layer theory. The calculations confirm the experimental finding that the degrees of compression attainable in ejectors in the presence of large pressure gradients exceed the limiting analytical values obtained from theories developed for moderate pressure gradients. (Author)

AD-750 565 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
MCCOWAN'S SOLITARY WAVE EXPANSIONS.
Memorandum rept.,
Serge J. Zaroodny. Aug 72, 22p Rept no. BRL-MR-2219

Descriptors: (*Water waves, Numerical analysis), Partial differential equations, Series, Hydrodynamics, Programming (Computers).
Identifiers: Solitary waves.

In 1894 McCowan proposed that the structure of solitary waves be represented by a certain series expansion; but he gave an estimate for only the first term of this expansion. Any truncation of such an expansion compromises the essential ideal of the steadiness of a solitary wave; also, the approximations which he adopted might not be the best ones for the diverse particular purposes for which this wave may be used. In the paper a more precise structure of this wave is constructed by implementing McCowan's expansion to higher orders. The coefficients in this expansion are determined by minimizing a certain reasonable measure of the imperfection of this expansion. This minimization is done by using the FNMIN subroutine. (Author)

AD-750 686 PC$3.00/MF$0.95
Rand Corp Santa Monica Calif
TRANSVERSE CURVATURE EFFECTS IN FLOWS ALONG CORNERS AND ON WAVY WALLS,
K. Gersten, and J. F. Gross. Jun 72, 39p Rept no. R-1004-PR
Contract F44620-67-C-0045

Descriptors: (*Wing-body configurations, Aerodynamic characteristics), Curved profiles, Laminar flow, Surface properties, Approximation (Mathematics), Heat transfer, Velocity, Shear stresses, Equations of motion.
Identifiers: *Corner flow, *Wavy walls.

The report investigates incompressible laminar flow in a corner and along a wavy wall. An asymptotic flow illustrates the effects of wall curvature. Expressions are obtained that relate skin friction and heat transfer to the inner curvature of the corner and the intensity of mass transfer at the surface. Comparisons are made to define a domain in which the solution to theory provides an adequate approximation. (Author)

AD-750 762 PC$3.00/MF$0.95
Colorado State Univ Fort Collins Dept of Mechanical Engineering
THREE EXPERIMENTS IN NATURAL CONVECTION.
Technical rept.,
Robert D. Haberstroh, Richard I. Loehrke, Richard D. Reinders, Ovid A. Plumb, and James M. Broughton. Sep 72, 63p Rept no. TR-2
Contract N00014-67-A-0299-0009
Report on Thermohaline Convection Project.

Descriptors: (*Convection (Heat transfer), *Sea water), Thermoclines, Boundary layer, Heat flux, Salts, Oils, Mathematical models, Theses.
Identifiers: Air water interactions.

The report presents detailed summaries of three experimental theses written at Colorado State University in connection with ongoing work on natural convection in doubly-diffusive media. Chapter I deals with the turbulent natural-convection heat flux through two liquid layers which are artificially and permanently stratified by density difference. A predictive model is advanced and tested against experimental data. The second chapter discusses experiments on the heat transfer from circular disks at the bottoms of the large tanks. Both the laminar and turbulent flow regimes are considered, and heat-transfer correlations are obtained. An uncorrelated effect of source diameter is noted and discussed. The third chapter treats mainly on the transport of heat and salt across turbulently convecting layers of salt water bounded above and below by thick, stable thermoclines. Both temperature and concentration are made to decrease upward in a steady or nearly steady experiment, and measurements are made of the flows of heat and salt. Observations are made of the properties of the thermoclines and of the convecting layers, and comparisons are made with the limited number of theoretical predictions currently available. (Author)

AD-750 924 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
STATIONARY FLOW OF EQUAL-DENSITY SUSPENSIONS THROUGH TUBES.
V. M. Borisov, V. G. Markov, and S. F. Palilova. 17 Aug 72, 15p Rept no. FTD-HC-23-1189-72
Edited trans. of Zhurnal Vychislitelnoi Matematiki i Matematicheskoi Fiziki (USSR) n3 p738-745 1971.

Descriptors: (*Particles, Fluid dynamic properties), (*Pipes, One-dimensional flow), Equations of motion, Drag, Velocity, Viscosity, USSR.
Identifiers: Particle suspension flow, Translation.

The steady-state one-dimensional motion of uniformly dense suspensions is considered. The suspension is considered as a continuous medium, the state of which at each point under steady-state motion is characterized by three variables: the concentration of particles, the velocity, and the effective viscosity. The effective viscosity is defined as the proportionality coefficient between the amount of energy E dispersed in a unit volume per unit time and the second invariant deformation velocity vector of the medium. The analysis is based on a maximum principle of the dispersed energy in steady-state motion. (Author)

AD-751 014 Reprint
New York Univ Bronx Geophysical Sciences Lab
EXPERIMENTAL STUDIES OF THE REFRACTION OF UNIFORM WAVE TRAINS AND TRANSIENT WAVE GROUPS NEAR A STRAIGHT CAUSTIC.
Yung-Yao Chao, and Willard J. Pierson. 10 May 72, 11p Rept no. Contrib-121
Contract N00014-67-A-0467-0012
Availability: Pub. in Jnl. of Geophysical Research, v77 n24 p4545-4554, 20 Aug 72.

Descriptors: (*Water waves, Refraction), Partial differential equations, Graphics, Gravity, Theory.
Identifiers: Caustics, Gravity waves, Ray tracing.

An experimental study of gravity wave behavior near a straight caustic was carried out in a wave tank that was 4.26 meters (14 feet) square and 30.48 centimeters (1 foot) deep. A uniform wave train was generated in shallow water of constant depth and propagated toward a portion of the tank where the depth increased linearly to a value equivalent to deep water. The straight line at which the depth started to increase was at 50 degrees to the wave crests at the generation source. The waves propagated up to this line, then refracted, totally reflected, and turned back toward the shallow water. The results of the experiment show that the experimental model not only successfully produces a caustic but also verifies the theoretical results near the caustic derived by Chao (1971) within the framework of a linear theory. The same bottom model was used to examine the refraction of transient wave groups. (Author)

AD-751 016 PC$3.00/MF$0.95
Naval Ordnance Lab White Oak Md
CO2 LASER RADIATION ABSORPTION IN SF6--AIR BOUNDARY LAYERS,
John D. Anderson, Jr., Jerry L. Wagner, and Joseph Knott. 1 Aug 72, 70p Rept no. NOLTR-72-172

Descriptors: (*Flow fields, Control systems), Gas lasers, Irasers, Sulfur compounds, Fluorides, Absorption spectrum, Heating, Wind tunnel models.
Identifiers: Sulfur hexafluoride, Carbon dioxide lasers, Atmospheric attenuation, Laser beams.

Previous investigators have shown that gaseous sulfur hexafluoride (SF6) is a strong absorber of radiation at 10.6 micrometers. This wavelength also corresponds to the output from common CO2 lasers. New experimental and theoretical results are presented for the 10.6 micrometers absorption coefficient and saturation properties of SF6-air mixtures at conditions near standard sea level. Variations with pressure, wavelength and temperature are measured. Results for 10 percent SF6-90 percent air at 1 atm show that such mixtures are stron absorbers of CO2 laser radiation, and that saturation intensities are larger than 10,000 watts/sq cm. Measurements of CO2 laser radiation absorption within boundary layers with SF6 injection are made on the sidewall of a small subsonic wind tunnel. The beam intensity is attenuated by several orders of magnitude due to absorption by the SF6. (Author)

N72-28277 PC$3.50/MF$0.95
Sydney Univ. (Australia). Dept. of Aeronautical Engineering.
EXPLORATORY MEASUREMENTS OF THE FLOW IN THE WING-TIP VORTICES OF A LOCKHEED HERCULES.
E. D. Poppleton. Dec 71, 29p ATN-7104
Subm- Sponsored By Dept. of Civil Aviation

Descriptors: *C-130 aircraft, *Flow measurement, *Trailing edges, Perturbation theory, Vortices.

For abstract, see STAR 10 19.

N72-28278 PC$3.00/MF$0.95
Stanford Univ., Calif. Dept. of Mechanical Engineering.
NONEQUILIBRIUM SHOCK WAVE STRUCTURE, 1. KINETICS OF NITRIC OXIDE FORMATION AND DECOMPOSITION, 2.
Semiannual Progress Report, 1 Nov. 1971 - 1 Jun. 1972
C. H. Kruger, and R. K. Hanson. 1 Jun 72, 12p NASA-CR-127691
Contract NGR-05-020-583

Descriptors: *Molecular flow, *Nitric oxide, *Rarefied gas dynamics, *Reaction kinetics, *Shock waves, Air pollution, Atomic collisions, Lasers, Mathematical models, Nonequilibrium flow.

For abstract, see STAR 10 19.

N72-28279 PC$5.75/MF$0.95
General Dynamics/Convair, San Diego, Calif. Aerospace Div.
AN ANALYTICAL STUDY OF REDUCED--GRAVITY LIQUID REORIENTATION USING A SIMPLIFIED MARKER AND CELL TECHNIQUE.
W. S. Betts, Jr. Aug 72, 73p NASA-CR-120944, GDCA-DDB72-003
Contract NAS3-14361

Descriptors: *Acceleration (physics), *Computer programs, *Flow characteristics, *Incompressible fluids, Computerized simulation, Finite difference theory, Navier-stokes equation.

For abstract, see STAR 10 19.

N72-28280 PC$7.50/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Freiburg (West Germany). Inst. Fuer Angewandte Mathematik Und Mechanik.
STEADY LAMINAR HYPERSONIC BOUNDARY LAYERS PAST AN AXISYMMETRIC HYPERBOLOID AT THERMOCHEMICAL EQUILIBRIUM.
D. Straub, W. Schoenauer, A. Schaber, S. Lin, and E. Adams. 1972, 106p DLR-FB-72-16
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Axisymmetric bodies, *Flow stability, *Gas dissociation, *Laminar boundary layer, Flow equations, Hypervelocity flow.

For abstract, see STAR 10 19.

N72-28281 PC$3.50/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Brunswick (West Germany). Inst. Fuer Aerodynamik.
SIMPLIFICATION OF CALCULATIONS AT THE OBLIQUE COMPRESSION SHOCK.
J. Wellmann. 1972, 28p DLR-FB-72-11
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Compression waves, *Numerical analysis, *Oblique shock waves, Angles (geometry), Wave equations, Wave reflection, Wedge flow.

For abstract, see STAR 10 19.

N72-28282 PC$5.75/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Porz (West Germany). Inst. Fuer Luftstrahlantriebe.
DATA REDUCTION METHODS FOR TWO DIMENSIONAL CASCADE MEASUREMENTS.
H. Starken, and P. Schimming. 1972, 77p
DLR-MITT-72-03
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Cascade flow, *Data reduction, *Two dimensional flow, Flow characteristics, Gas dynamics, Wakes.

For abstract, see STAR 10 19.

N72-28283 PC$4.50/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Berlin (West Germany). Inst. Fuer Turbulenzforschung.
SPACE CORRELATIONS OF THE FLUCTUATING PRESSURE IN SUBSONIC TURBULENT JETS.
H. V. Fuchs. 1972, 50p DLR-FB-72-07

Descriptors: *Pressure distribution, *Pressure gradients, *Turbulent jets, *Turbulent mixing, Dimensional analysis, Sound transducers, Subsonic flow, Turbulent flow.

For abstract, see STAR 10 19.

N72-28284 PC$5.25/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Berlin (West Germany). Inst. Fuer Turbulenzforschung.
ON MULTIPLE AND UPSTREAM RUNNING WAVES IN FREE JETS.
D. Bechert. 1972, 65p DLR-FB-72-06
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Boundary layer flow, *Flow stability, *Free jets, *Jet flow, Boundary layer stability, Circulation, Fluid dynamics, Phase shift, Wave propagation.

For abstract, see STAR 10 19.

N72-28285 PC$6.00/MF$0.95
California Univ., Davis. Dept. of Mechanical Engineering.
A COMPUTER PROGRAM FOR THE CALCULATION OF LAMINAR AND TURBULENT BOUNDARY LAYER FLOWS.
H. A. Dwyer, E. D. Doss, and A. L. Goldman.
1972, 76p NASA-CR-114366
Contract NAS2-6362

Descriptors: *Computer programs, *Laminar boundary layer, *Turbulent boundary layer, Axisymmetric flow, Boundary value problems, Compressible flow, Equations of motion, Incompressible flow, Two dimensional flow.

For abstract, see STAR 10 19.

N72-28286 PC$3.00/MF$0.95
California Univ., Santa Barbara.
VORTEX EQUATIONS SINGULARITIES, NUMERICAL SOLUTION, AND AXISYMMETRIC VORTEX BREAKDOWN.
H. H. Bossel. Jul 72, 74p NASA-CR-2090
Contract NGR-05-010-025

Descriptors: *Numerical analysis, *Vortex breakdown, *Vortices, Incompressible flow, Navier-stokes equation, Parameterization, Series (mathematics), Weighting functions.

For abstract, see STAR 10 19.

N72-28288 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CHOKED FLOW OF FLUID NITROGEN WITH EMPHASIS ON THE THERMODYNAMIC CRITICAL REGION.
R. C. Hendricks, R. J. Simoneau, and R. C. Ehlers.
1972, 28p NASA-TM-X-68107, E-7044
Conf- Presented At Cryog. Eng. Conf., Boulder, Colo., 9-11 Aug. 1972

Descriptors: *Critical flow, *Flow velocity, *Nozzle flow, Critical pressure, Critical temperature, Inlet pressure, Nitrogen, Stagnation pressure.

For abstract, see STAR 10 19.

N72-28290 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
EXPERIMENTAL STUDY OF DIFFUSER CHANNELS WITH PRESEPARATION STATE OF THE TURBULENT BOUNDARY LAYER.
L. A. Bychkova. Jul 72, 12p NASA-TT-F-14366
Contract NASW-2035
Tran- Transl. Into English From Inzh.-fiz. Zh. (Moscow), V. 21, No. 3, Sep. 1971 P 518-523

Descriptors: *Aerodynamic characteristics, *Channel flow, *Diffusion, Flow geometry, Turbulent boundary layer, Velocity distribution.

For abstract, see STAR 10 19.

N72-28291 PC$3.25/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
ON THE MOVEMENTS OF A VISCOUS, COMPRESSIBLE, HEAT-CONDUCTING FLUID IN A SPHERICAL LAYER.
N. M. Astafyeva, I. Y. Brailovskaya, and I. M. Yavorskaya. Aug 72, 23p NASA-TT-F-14373
Contract NASW-2038
Tran- Transl. Into English of O Dvizheniyakh Vyazkoy Szhimay Teploprovodnoy Zhidkosti V Sfericheskom Sloye, Rept. Pr-96. Acad. Sci. USSR, Moscow, 1972 28 P

Descriptors: *Axisymmetric flow, *Fluid flow, *Numerical analysis, *Rotating spheres, Compressible flow, Fluid mechanics, Navier-stokes equation, Viscous flow.

For abstract, see STAR 10 19.

N72-28293 PC$13.25/MF$0.95
Max-planck-institut Fuer Stromungsforschung, Gottingen (West Germany).
WEDGE- AND CAPILLARY-FLOWS CONSIDERING THE TEMPERATURE AND PRESSURE DEPENDENCE OF VISCOSITY . SPALT- UND KAPILLARENSTROEMUNG BEI BERUECKSICHTIGUNG DER TEMPERATUR- UND DRUCKABHAENGIGKEIT DER VISKOSITAET.
U. Rost. 1971, 222p REPT-54

Descriptors: *Fluid flow, *Pressure effects, *Temperature effects, *Viscosity, Bearings, Capillary flow, Heat transfer, Lubricants, Transport properties, Wedge flow.

For abstract, see STAR 10 19.

N72-28294 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE INTERACTION OF MODERATELY STRONG SHOCK WAVES WITH THICK PERFORATED WALLS OF LOW POROSITY.
D. J. Grant. Aug 72, 61p NASA-TN-D-6902, G-1069

Descriptors: *Perforated plates, *Porous walls, *Shock waves, *Traveling waves, Flow distribution, Fluid dynamics, Mathematical models, Shock tubes.

For abstract, see STAR 10 19.

N72-28295 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ANALYTICAL INVESTIGATION OF CONICAL DIFFUSERS.
J. L. Means, P. C. Glance, and H. A. Klassen. Aug 72, 26p NASA-TM-X-2605, E-6908
Subm- Sponsored in Part By Army Air Mobility R and D Lab.

Descriptors: *Air flow, *Boundary layer flow, *Conical flow, *Diffusers, Flow equations, Flow theory, Numerical analysis, Performance prediction.

For abstract, see STAR 10 19.

N72-28299 PC$4.00/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Trauen (West Germany). Abteilung Thermogasdynamik.
LATERAL INJECTION OF AN INCOMBUSTIBLE LIQUID INTO A HOT GAS FLOW.
W. Dobrzynski. Feb 72, 37p DLR-FB-72-19
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Cross flow, *High temperature gases, *Hydraulic jets, *Liquid injection, Flow deflection, Gas flow, Nozzle geometry, Photographic recording, Temperature profiles, Vaporizing.

For abstract, see STAR 10 19.

N72-28937 PC$8.25/MF$0.95
Max-planck-institut Fuer Stromungsforschung, Gottingen (West Germany).
BIBLIOGRAPHY OF PUBLICATIONS, 1960 - 1970 AND SUPPLEMENT TO BIBLIOGRAPHY OF PUBLICATIONS, 1907 - 1959 . BIBLIOGRAPHIE DER VEROEFFENTLICHUNGEN 1960- -1970 UND NACHTRAG ZU BIBLIOGRAPHIE DER VEROEFFENTLICHUNGEN 1907-1959.
1971, 122p REPT-50

Descriptors: *Aerodynamics, *Bibliographies, *Germany, *Hydrodynamics, Documents, Fluid dynamics, Research projects.

For abstract, see STAR 10 19.

N72-28992 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
NUMERICAL CALCULATION OF BOUNDARY- -INDUCED INTERFERENCE IN SLOTTED OR PERFORATED WIND TUNNELS INCLUDING VISCOUS EFFECTS IN SLOTS.
J. D. Keller. Aug 72, 22p NASA-TN-D-6871, L-8349

Descriptors: *Boundary layer flow, *Flow resistance, *Viscous flow, *Wall flow, *Wind tun-

nels, Flow distribution, Flow measurement, Flow stability.

For abstract, see STAR 10 20.

N72-28993 PC$3.25/MF$0.95
National Aeronautical Establishment, Ottawa (Ontario).
EXPERIMENTAL DAMPING-IN-PITCH OF TWO SLENDER CONES AT MACH 2 AND INCIDENCES UP TO 30 DEG.
S. Iyenger. Jan 72, 25p NASA-CR-114483, LTR-UA-19
Contract NASW-1947

Descriptors: *Aerodynamic characteristics, *Conical bodies, *Oscillations, Angle of attack, Oscillation dampers, Supersonic speeds.

For abstract, see STAR 10 20.

N72-28999 PC$5.00/MF$0.95
Royal Aircraft Establishment, Farnborough (England). Structures Dept.
BOUNDARY-LAYER PRESSURE FLUCTUATIONS AT HIGH REYNOLDS NUMBERS ON A FREE-FLIGHT TEST VEHICLE.
D. R. Roberts. 1972, 60p ARC-CP-1208, RAE-TR-71033
Misc 0supersedes Rae-tr-71033 Arc-33171

Descriptors: *Flight test vehicles, *Free flight, *Pressure distribution, *Supersonic speeds, Autocorrelation, Isotropic turbulence, Power spectra, Solid propellant rocket engines, Turbulent boundary layer.

For abstract, see STAR 10 20.

N72-29227 PC$5.75/MF$0.95
Advanced Technology Labs., Inc., Jericho, N.Y.
UNSTEADY FLOW THROUGH COMPRESSOR STAGES.
E. Alzner, and J. Erdos. Dec 71, 72p NASA-CR-127765, ATL-TR-168
Contract NASW-2057

Descriptors: *Flow distribution, *Nonuniform flow, *Stators, Boundary layer flow, Rotors, Turbomachinery.

For abstract, see STAR 10 20.

N72-29229 PC$12.50/MF$0.95
Boeing Co., Renton, Wash.
PREDICTION OF UNSTEADY AERODYNAMIC LOADINGS CAUSED BY TRAILING EDGE CONTROL SURFACE MOTIONS IN SUBSONIC COMPRESSIBLE FLOW COMPUTER PROGRAM DESCRIPTION.
M. C. Redman, W. S. Rowe, and B. A. Winther. 1972, 207p NASA-CR-112015
Contract NAS1-10536

Descriptors: *Aerodynamic loads, *Compressible flow, *Computer programs, *Control surfaces, *Subsonic speed, Aerodynamic characteristics, Lift devices, Lifting bodies, Numerical analysis, Surfaces.

For abstract, see STAR 10 20.

N72-29230 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LIQUID INFLOW TO A BAFFLED CYLINDRICAL TANK DURING WEIGHTLESSNESS.
J. V. Staskus. Aug 72, 28p NASA-TM-X-2598, E-6899

Descriptors: *Cylindrical tanks, *Inlet flow, *Weightlessness, Baffles, Fluid flow, Propellant transfer.

For abstract, see STAR 10 20.

N72-29231 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
EFFECTS OF WALL COOLING AND ANGLE OF ATTACK ON BOUNDARY LAYER TRANSITION ON SHARP CONES AT FREE STREAM MACH 7.4.
G. G. Mateer. Aug 72, 14p NASA-TN-D-6908, A-4419

Descriptors: *Angle of attack, *Boundary layer transition, *Half cones, *Mach number, *Wall temperature, Hypervelocity wind tunnels, Reynolds number, Surface cooling.

For abstract, see STAR 10 20.

N72-29232 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
NUMERICAL SOLUTIONS OF SEVERAL REFLECTED SHOCK-WAVE FLOW FIELDS WITH NONEQUILIBRIUM CHEMICAL REACTIONS.
R. K. Hanson, L. L. Presley, and E. V. Williams. Aug 72, 49p NASA-TN-D-6885, A-4226

Descriptors: *Chemical reactions, *Flow distribution, *Method of characteristics, *Nonequilibrium conditions, *Shock waves, Diatomic gases, Rankine-hugoniot relation, Reflected waves, Relaxation time, Thermodynamic properties.

For abstract, see STAR 10 20.

N72-29233 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
TURBULENT BOUNDARY-LAYER VELOCITY PROFILES ON A NONADIABATIC AT MACH NUMBER 6.5.
E. R. Keener, and E. J. Hopkins. Aug 72, 48p NASA-TN-D-6907, A-4240

Descriptors: *Flat plates, *Turbulent boundary layer, *Velocity distribution, Mach number, Mixing length flow theory, Skin friction, Wall temperature, Wind tunnel models.

For abstract, see STAR 10 20.

N72-29234 PC$3.50/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
MEASUREMENT OF RAPIDLY VARYING HYDRAULIC FLOW RATES BY ULTRASONIC WAVES.
P. Alais, and J. C. Demarais. Aug 72, 30p NASA-TT-F-14392, ONERA-TP-1078
Contract NASW-2038
Tran- Transl. Into English of Mesure de Debits Liquides Rapidement Variables Au Moyen Dondes Ultra-sonores, Rept. Onera-tp-10-78 Office Natl. Detudes Et de Rech. Aerospatiale, 1972

Descriptors: *Flow velocity, *Liquid flow, *Pressure effects, *Ultrasonic radiation, Convective flow, Hydraulic fluids.

For abstract, see STAR 10 20.

N72-29235 PC$3.25/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
NUMERICAL CALCULATION OF LAMINAR COMPRESSIBLE BOUNDARY LAYERS IN UNSTEADY FLOW.
J. Piquet. Aug 72, 23p NASA-TT-F-14410
Contract NASW-2035
Tran- Transl. Into English From J. Mecan (Paris), V. 11, No. 1, 1972 P 5-27

Descriptors: *Boundary layer flow, *Compressible boundary layer, *Flat plates, *Laminar boundary layer, *Problem solving, Shock tubes, Shock waves, Temperature, Velocity.

For abstract, see STAR 10 20.

N72-29236 PC$3.25/MF$0.95
National Aeronautical Establishment, Ottawa (Ontario). Unsteady Aerodynamics Section.
STATIC AND DYNAMIC PITCHING MOMENT MEASUREMENTS ON A FAMILY OF ELLIPTIC CONES AT MACH NUMBER 11 IN HELIUM.
K. Orlik-rueckemann, and J. G. Laberge. Jul 70, 25p NASA-CR-114482, LTR-UA-14
Contract NASW-1947

Descriptors: *Cones, *Elliptical cylinders, *Helium, *Pitching moments, *Wind tunnel stability tests, Aerodynamic characteristics, Dynamic tests, Hypervelocity wind tunnels, Static tests, Wind tunnel models.

For abstract, see STAR 10 20.

N72-29238 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LIQUID INFLOW TO INITIALLY EMPTY CYLINDRICAL TANKS IN LOW GRAVITY.
C. M. Spuckler. Aug 72, 22p NASA-TM-X-2613, E-6969

Descriptors: *Liquid flow, *Tanks (containers), *Weightlessness, Data acquisition, Hydrodynamics, Tables (data).

For abstract, see STAR 10 20.

N72-29239 PC$4.25/MF$0.95
Kyoto Univ. (Japan).
ON ENTROPY IN NONEQUILIBRIUM NOZZLE FLOWS OF VIBRATIONALLY RELAXING DIATOMIC GASES.
R. Ishii. 15 Aug 72, 43p
Subm- Backup Document for Aiaa Synoptic Scheduled for Publication in Aiaa Journal on Jan. 1973

Descriptors: *Diatomic gases, *Entropy, *Molecular relaxation, *Nozzle flow, Critical point, Flow distribution, Stagnation point.

For abstract, see STAR 10 20.

N72-29243 PC$4.00/MF$0.95
Ernst-mach-inst., Freiburg (West Germany).
COMPUTATION AND VISUALIZATION OF THE ENTROPY WAKE BEHIND BLUNT BODIES IN HYPERSONIC FLOW . BERECHNUNG UND VISUALISIERUNG DES ENTROPIENACHLAUFS STUMPFER HYPERSCHALL-FLUGKOERPER.
H. Giesbrecht, W. Merzkirch, and A. Stilp. Dec 71, 40p REPT-8/71
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Flow visualization, *Hypersonic wakes, *Hypervelocity projectiles, *Mathematical models, *Schlieren photography, Blunt bodies, Bow waves, Circular cylinders, Density distribution, Entropy, Shock waves, Spheres.

For abstract, see STAR 10 20.

N72-29244 PC$3.50/MF$0.95
Cambridge Univ. (England). Dept. of Engineering.
BOUNDARY-LAYER SUCTION TO ELIMINATE CORNER SEPARATION IN CASCADES OF AEROFOILS.
R. E. Peacock. 1971, 26p ARC-R/M-3663, ARC-27291
Misc 0supersedes Arc-27291

Descriptors: *Boundary layer control, *Cascade flow, *Corners, *Suction, Airfoil fences, Boundary layer separation, Cascade wind tunnels, Compressor blades, Flow visualization.

For abstract, see STAR 10 20.

N72-29245 PC$3.50/MF$0.95
Cambridge Univ. (England). Dept. of Engineering.
THE MEASUREMENT OF REYNOLDS STRESSES IN LOW INTENSITY TURBULENCE FLOW.
H. J. Perkins. 1971, 30p ARC-R/M-3668, ARC-31748
Misc 0supersedes Arc-31748

Descriptors: *Hot-wire anemometers, *Stress tensors, *Turbulent flow, Dynamic response, Flow measurement, Reynolds number, Separated flow, Velocity measurement.

For abstract, see STAR 10 20.

N72-29246 PC$4.00/MF$0.95
Manchester Univ. (England). Dept. of the Mechanics of Fluids.
TWO-DIMENSIONAL SELF-PRESERVING TURBULENT MIXING LAYERS AT DIFFERENT FREE STREAM VELOCITY RATIOS.
A. J. Yule. 1972, 39p ARC-R/M-3683, ARC-32732
Misc 0supersedes Arc-32732

Descriptors: *Turbulent mixing, *Velocity measurement, Boundary layers, Free flow, Gas streams, Mixing length flow theory, Preserving, Shear flow, Velocity distribution.

For abstract, see STAR 10 20.

N72-29247 PC$3.50/MF$0.95
Cambridge Univ. (England). Dept. of Engineering.
THEORETICAL ANALYSIS OF FLUCTUATING LIFT ON THE ROTOR OF AN AXIAL TURBOMACHINE.
R. E. Henderson, and H. Daneshyar. 1972, 30p ARC-R/M-3684, ARC-42368
Misc 0supersedes Arc-42368

Descriptors: *Axial flow turbines, *Rotor blades (turbomachinery), *Rotor lift, Airfoils, Cascade flow, Potential flow, Steady flow, Vorticity.

For abstract, see STAR 10 20.

N72-30259 PC$11.75/MF$0.95
Stanford Univ., Calif. Thermoscience Div.
THE TURBULENT BOUNDARY LAYER ON A POROUS PLATE AN EXPERIMENTAL STUDY OF THE FLUID MECHANICS FOR ADVERSE FREE STREAM PRESSURE GRADIENTS.
P. S. Anderson, W. M. Kays, and R. J. Moffat. May 72, 194p NASA-CR-127817, HMT-15
Contract NGR-05-020-134

Descriptors: *Boundary layer flow, *Shear stress, *Turbulent boundary layer, *Wall flow, Pressure gradients, Skin friction, Stress analysis.

For abstract, see STAR 10 21.

N72-30260 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A SEARCH FOR THE EFFECT OF A HIGH FREQUENCY SPARK ON BOUNDARY-LAYER TRANSITION AT MACH 8.5.
J. B. Anders, W. B. Boatright, and J. R. Nayadley, Sr. Aug 72, 25p NASA-TM-X-2610, L-8314

Descriptors: *Boundary layer transition, *Sparks, *Wind tunnel models, Electrodes, Hypersonic speed.

For abstract, see STAR 10 21.

N72-30261 PC$5.50/MF$0.95
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
STUDY OF LOW REYNOLDS NUMBER NOZZLE FLOWS, INCLUDING RADIAL PRESSURE GRADIENTS.
Final Report
W. J. Rae. Jul 72, 66p NASA-CR-112112, CAL-A1-3108-A-1
Contract NAS1-10806

Descriptors: *Axisymmetric flow, *Laminar flow, *Nozzle flow, *Pressure gradients, Computerized simulation, Flow equations, Partial differential equations.

For abstract, see STAR 10 21.

N72-30263 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
HEAT TRANSFER IN LAMINAR SUPERSONIC BOUNDARY LAYER WITH BLOWING OF A LIGHT GAS WITH DESIRED PRESSURE AND HEAT DISTRIBUTION.
W. Wuest. Aug 72, 20p NASA-TT-F-14515
Contract NASW-2035
Tran- Transl. Into English From the Publ. Jahrbuch 1965 Der Wgl 1965 P 211-216

Descriptors: *Boundary layer flow, *Heat transfer, *Laminar flow, *Thermodynamic properties, Flow equations, Flow theory, Gas flow, Velocity measurement.

For abstract, see STAR 10 21.

N72-30267 PC$3.00/MF$0.95
Old Dominion Univ. Research Foundation, Norfolk, Va.
AN EXPERIMENTAL INVESTIGATION OF A COLD JET EMITTING FROM A BODY OF REVOLUTION INTO A SUBSONIC FREE STREAM.
D. S. Ousterhout. Aug 72, 167p NASA-CR-2089
Contract NGL-47-003-039

Descriptors: *Aerodynamic configurations, *Jet mixing flow, *Pressure distribution, *Subsonic speed, Aerodynamic characteristics, Angle of attack, Flat plates.

For abstract, see STAR 10 21.

N72-30268 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
OUTLET BAFFLES EFFECT ON LIQUID RESIDUALS FROM ZERO-GRAVITY DRAINING OF HEMISPHERICALLY ENDED CYLINDERS.
E. P. Symons. Sep 72, 20p NASA-TM-X-2631, E-6986

Descriptors: *Baffles, *Cylindrical tanks, *Liquids, Drainage, Weightlessness.

For abstract, see STAR 10 21.

N72-30269 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PARTICLE TRACKABILITY CONSIDERATIONS FOR LASER DOPPLER VELOCIMETRY.
A. M. Karchmer. Sep 72, 22p NASA-TM-X-2628, E-6992

Descriptors: *Fluid flow, *Particle trajectories, Doppler effect, Lasers.

For abstract, see STAR 10 21.

N72-30275 PC$4.50/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PRESSURE-FLUCTUATION INPUTS AND RESPONSE OF PANELS UNDERLYING ATTACHED AND SEPARATED SUPERSONIC TURBULENT BOUNDARY LAYERS.
C. F. Coe, and W. J. Chyu. Sep 72, 50p NASA-TM-X-62189

Descriptors: *Panels, *Pressure distribution, *Shock waves, *Turbulent boundary layer, Correlation, Flow distribution, Structural strain, Supersonic speeds, Surface properties, Transonic speed.

For abstract, see STAR 10 21.

N72-30276 PC$4.00/MF$0.95
New York Univ., N.Y. Aerospace Lab.
INTERACTION BETWEEN AN UPSTREAM FACING WALL JET AND A SUPERSONIC STREAM.
R. Piva. 25 Jan 72, 36p NASA-CR-112165
Contract NGR-33-016-131
Subm- Backup Document for Aiaa Synoptic Scheduled for Publication in Aiaa Journal, Jan. 1973

Descriptors: *Flow geometry, *Flow theory, *Supersonic flow, *Wall flow, Jet mixing flow, Mathematical models, Numerical analysis.

For abstract, see STAR 10 21.

N72-30280 PC$3.50/MF$0.95
Office National Detudes Et de Recherches Aerospatiales, Paris (France).
CALCULATION METHOD OF THE SUPERCRITICAL FLOW OVER AN AIRFOIL IN A NOZZLE . METHODE DE CALCUL DE LECOULEMENT SUPERCRITIQUE SUR UN PROFIL PLACE DANS UNE TUYERE.
P. Labal. 1972, 26p ONERA-NT-189
LANG- IN FRENCH ENGLISH SUMMARY

Descriptors: *Airfoil profiles, *Nozzle flow, *Shock waves, *Supercritical flow, *Time dependence, Axisymmetric flow, Boundary value problems, Computer programming, Equations of motion, Similitude law, Transonic nozzles.

For abstract, see STAR 10 21.

N72-30281 PC$8.25/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Brunswick (West Germany). Inst. Fuer Luftsaugende Antriebe.
INVESTIGATIONS ON THE FLOW IN A CONSTANT AREA DUCT WITH HEAT TRANSFER AND FRICTION . UNTERSUCHUNGEN ZUR ISOPLANEN STROEMUNG MIT WAERMEAUSTAUSCH UND REIBUNG.
Ph.D. Thesis - Brunswick Univ.
W. Alvermann. Feb 72, 122p DLR-FB-72-32
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Ducted flow, *Flow coefficients, *Friction factor, *Heat transfer, Boundary layer flow, Cooling, Flow charts, Momentum transfer, Shock heating, Subsonic flow, Supersonic flow, Turbulent boundary layer.

For abstract, see STAR 10 21.

N72-30282 PC$4.50/MF$0.95
Waterloopkundig Laboratorium, Delft (Netherlands).
NUMERICAL METHODS FOR THE SOLUTION OF DIFFUSION ADVECTION EQUATIONS.
J. Siemons. Dec 70, 50p PUBL-88

Descriptors: *Advection, *Finite difference theory, *One dimensional flow, *Partial differential equations, *Two dimensional flow, Diffusion, Problem solving, Time, Truncation errors.

For abstract, see STAR 10 21.

PB-212 751 PC$3.00/MF$0.95
Council for Scientific and Industrial Research, Pretoria (South Africa). Chemical Engineering Group.

RHEOLOGY OF NON-NEWTONIAN FLUIDS. REVIEW WITH SPECIAL REFERENCE TO PARTICLE SUSPENSIONS,
M. Skubnik, and D. L. Peters. Jun 72, 54p CSIR-REVIEW-O/CHEM-6
International Standard Book No. 0-7988-0213-8.

Descriptors: (*Non Newtonian fluids, *Rheology), (*Particles, Dispersions), Viscometry, Slurries, Beer, Fluid dynamic properties, Irreversible processes, Theory, Reviews, South Africa.
Identifiers: *Particle suspension flow, Bantu beer.

The theory of non-Newtonian rheology and viscometric measurement is reviewed with special emphasis on particle suspensions of interest to the Chemical Engineering Group, namely, mineral slurries and bantu beer materials. These suspensions frequently exhibit irreversible changes in properties with time as well as local variations in apparent viscosity due to separation of particles; both effects must be taken into account in viscometry as well as in design or analysis of the full-scale equipment used in processing these materials. No single type of viscometer is entirely suited to routine work with suspensions; wide-gap rotational instruments as well as pipe viscometers yield measurements probably of only qualitative value except for the specific geometries studied. Sophisticated and expensive narrow-gap instruments are more suited to gathering fundamental data provided rather elaborate precautions are taken to achieve constant conditions. (Author)

20E. Masers and Lasers

AD-750 314 PC$3.00/MF$0.95
Army Missile Command Redstone Arsenal Ala
THEORETICAL STUDIES OF HIGH ENERGY PULSED CO2 LASERS,
Charles Cason, and Steven J. Kast. 1972, 16p

Descriptors: (*Gas lasers, Reaction kinetics), (*Irasers, Performance (Engineering)), Gas ionization, Electron density, Gain, Mathematical models.
Identifiers: *Carbon dioxide lasers.

Pulsed CO2 lasers are receiving considerable attention at the US Army Missile Command because of their advantages over cw lasers. Theoretical studies of laser kinetic processes, together with a new pressure scaling method developed in-house, have led to the development of a useful mathematical model for electron-beam-controlled CO2 lasers which shows close agreement with experimental observations. The model has indicated that energies approaching 80 joules/liter-atm are possible. The current goal of a 10-kJ/pulse laser is realizable in a 200 liter-atm laser is realizable in a 200 liter-atm laser structure.

AD-750 636 PC$3.00/MF$0.95
Utah Univ Salt Lake City Microwave Device and Physical Electronics Lab
CONSOLIDATED QUARTERLY REPORT FOR THE PERIOD JULY 1, 1971 TO SEPTEMBER 30, 1971.
Technical rept.,
R. L. Arnold, P. W. Chen, C. H. Durney, O. P. Gandhi, and R. W. Grow. 30 Sep 71, 107p Rept nos. MDL-Q38, UTEC-MD-72-073
Contracts N00014-69-C-0345, N00014-67-A-0325-0005
Sponsored in part by Grants DA-ARO-D-31-124-71-G-111 and NSF-GK-16574.

Descriptors: (*Coherent radiation, Frequency multipliers), (*Semiconductors, Plasma medium), Gas lasers, Electrooptics, Microwave frequency, Carriers (Semiconductors), Indium antimonides, Crossed field devices, Photodiodes, Indium compounds, Arsenides.
Identifiers: *Parametric oscillators, Second harmonic generation, Carbon dioxide lasers, *Plasma diagnostics, Laser beams, Semiconductor plasmas, Indium arsenides.

The broad purpose of the research activity reported herein is to extend the useful frequency spectrum into the range from microwave frequencies to optical frequencies and to improve existing devices and techniques in the microwave spectrum. At present this objective is being pursued by studies of electron beam devices, quantum electronic devices, plasmas, and solid-state devices. (Author)

AD-750 680 PC$3.00/MF$0.95
Institute for Defense Analyses Arlington Va Jason Div
REPORT OF THE 1971 JASON LASER SUMMER STUDY. VOLUME II. SUPPORTING APPENDICES A-M,
John F. Asmus, Kenneth M. Case, Roger Dashen, Ali Javan, and Paul Kelley. Aug 71, 216p* Rept no. S-391-2 IDA/HQ-71-13452
Contract DAHC15-67-C-0011
See also report dated Aug 71, AD-743 098.

Descriptors: (*Lasers, Scientific research), Gas lasers, Irasers, Medical research, Radiobiology, Light communication systems, Stereoscopic photography, Data storage systems, Chemical industry, Photochemistry, Air pollution, Geophysics, Distance-measuring equipment, Strain gages, Meteorological instruments, Manufacturing methods, Non-destructive testing, Mining engineering, Safety, Astrophysics, Biophysics, Biochemistry, Symposia, State-of-the-art reviews.
Identifiers: Laser radiobiology, Holography, Holographic information storage, Optical data processing, Laser radiation protection.

The volume contains a summary of the current state of the art in laser devices and associated technology, plus discussions of the current and potential uses of lasers in the following areas: medicine and biological research, communications, holography and information processing, chemical processing, atmospheric monitoring and air pollution detection, geophysics, industry, basic research in the physical sciences, and ignition of controlled thermonuclear reactions. The current status of laser safety standards and laws is also discussed. These articles provide the background for the conclusions and recommendations given in Volume I. (Author)

AD-750 711 PC$3.00/MF$0.95
IBM Watson Research Center Yorktown Heights N Y
STUDY OF OPTICAL MASERS.
Final rept. 1 Apr 64-13 Apr 72,
G. Burns, and P. P. Sorokin. Oct 72, 12p
AROD-3318:89-P
Contract DA-31-124-ARO (D)-205

Descriptors: (*Lasers, Scientific research), Irasers, Light pulses, Pumping (Optical), Frequency multipliers, Harmonic analysis, Optical materials.
Identifiers: Q switched lasers, Organic dye lasers, Second harmonic generation.

The contract covers a broad program of laser research. It includes studies of the laser itself, novel lasers, novel components of laser systems, studies of the quantum noise of lasers, spectroscopy of laser systems, basic properties of crystals that can be used in conjunction with lasers. (Author)

AD-750 777 PC$3.00/MF$0.95
Texas Univ Dallas
INVESTIGATION OF THE FEASIBILITY OF THE ELECTRON BEAM-EXCITED, HIGH-PRESSURE RECOMBINATION LASER.
Semi-annual technical rept. no. 1, 21 Mar-21 Oct 72,
Carl B. Collins. 21 Oct 72, 84p Rept no. UTDP-A002-1
Contract N00014-67-A-0310-0007, ARPA Order-1807

Descriptors: (*Gas lasers, Feasibility studies), (*Plasma medium, Transformations), Spectra (Visible + ultraviolet), Electron transitions, Atomic energy levels, Recombination reactions, Electron density, Experimental design.

The report describes research applied toward the determination of the feasibility of developing a recombining, electron beam-excited plasma into a pulsed laser of exceptionally high peak power. (Author)

AD-750 789 PC$3.00/MF$0.95
Queen'S Univ Belfast (Northern Ireland) Dept of Pure and Applied Physics
LASER PICOSECOND PULSE GENERATION AND MEASUREMENT.
Final scientific rept. 1 Sep 69-29 Feb 72,
D. J. Bradley. 29 Feb 72, 211p AFCRL-72-0364
Contract F61052-70-C-0003

Descriptors: (*Lasers, Light pulses), Dyes, Pumping (Optical), Frequency multipliers, Travelingwave tubes, Great Britain.
Identifiers: Ruby lasers, Mode locked lasers, Quinolium/1-ethyl-4- (3- (1-ethyl-4-quinolylidene)propenyl), Aziridinium/dimethyl-phenyl, Rhodamine 6G, Xanthene dyes, Cyanine dyes, Two photon fluorescence.

Detailed studies of ruby laser mode-locking with saturable absorbers were carried out. Oscillation in pure, low order transverse modes has been achieved and improvements in pulse duration and general reproducibility have been obtained by employing DDCI in optical contact with a laser cavity mirror. Anomalous quenching effects of two-photon fluorescence patterns in Rhodamine 6G and DPA have been extensively studies. Transverse mode-locking of the ruby laser has also been observed in a confocal cavity which also produced simultaneous transverse and longitudinal mode-locking. The saturable action of phthalocyanine dyes in the vapour phase has been studied and successful Q-switching of the ruby laser employing phthalocyanine vapour has been accomplished. (Author)

N72-28522 PC$12.50/MF$0.95
Yale Univ., New Haven, Conn.
PART 1 CLASSICAL LASER. PART 2 THE EFFECT OF VELOCITY CHANGING COLLISIONS ON THE OUTPUT OF A GAS LASER.
Ph.D. Thesis
M. Borenstein. 1972, 208p NASA-CR-127680
Contracts NGR-07-004-035, AF-AFOSR-1324-67

Descriptors: *Lasers, *Mathematical models, Electromagnetic fields, Gas lasers, Oscillators, Particle collisions, Particle interactions, Polarization (waves).

For abstract, see STAR 10 19.

N72-28525 PC$3.00/MF$0.95
Defence Standards Labs., Maribyrnong (Australia).
PREPARATION OF GOLD COATED STAINLESS STEEL REFLECTING SURFACES FOR USE AS LASER OPTICAL COMPONENTS FOR 10.6 MICRONS RADIATION.
J. Allen. May 72, 9p TN-248

Descriptors: *Carbon dioxide lasers, *Laser outputs, *Optical equipment, *Stainless steels, Gold, Laboratory equipment, Substrates, Vacuum deposition.

For abstract, see STAR 10 19.

N72-28700 PC$3.00/MF$0.95
California Inst. of Tech., Pasadena.
RESEARCH IN NONLINEAR OPTICS.
Final Report, 1 Nov. 1967 - 1 Nov. 1970
A. Yariv. 21 May 72, 20p NASA-CR-122448
Contract NGR-05-002-107

Descriptors: *Kerr effects, *Lasers, *Liquids, *Ruby, Laser modes, Q switched lasers, Steady state.

For abstract, see STAR 10 19.

20F. Optics

AD-750 347 PC$3.00/MF$0.95
Frankford Arsenal Philadelphia Pa
FABRICATION OF OPTICAL ELEMENTS BY MEANS OF A LOW ENERGY ION BEAM,
James D. Lester. 1972, 12p

Descriptors: (*Optical equipment, Manufacturing methods), Ion beams, Sputtering, Surfaces, Automation.
Identifiers: Numerical control.

A sophisticated new optical manufacturing process is described which represents the first significant departure from optical figuring techniques developed in antiquity. The process removes material from solid surfaces on the atomic level process removes material from solid surfaces on the atomic level and is capable of figuring large diameter optics to well within 1/50 of the wavelength of visible light. The process is numerically controlled and off axis and aspheric surfaces may be figured as easily as spheres and flats. The system greatly increases the freedom of the optical designer in specifying surface contours and significantly reduces requirements for skilled optical craftsmen. (Author)

AD-750 545 PC$3.00/MF$0.95
Texas Univ Austin Electronics Research Center
OPTICAL BIREFRINGENCE MEASUREMENT BY MEANS OF A ROTATING ANALYZER WITH APPLICATION TO KERR EFFECT.
Technical rept.,
G. B. Thurston, and R. S. Wilkinson. 15 Mar 72, 34p Rept no. TR-122 AFOSR-TR-72-0732
Contract F44620-71-C-0091

Descriptors: (*Birefringence, Measurement), (*Electrooptics, Measurement), Optical equipment, Kerr cells.
Identifiers: Polarized electromagnetic radiation, *Kerr electrooptic effect.

A rotating analyzer method was developed for rapid measurement of the ellipticity of polarized light as produced by optically birefringent materials. A plane optical analyzer, in the form of a Glann-Thompson prism, is placed in the light path ahead of an electrical photodetector and is continuously rotated on an axis coincident with the light path. For light having either constant or slowly varying ellipticity, this lead to sinusoidally time varying electrical signals which bear a simple relationship to the eccentricity and orientation of the ellipticity. In application to the Kerr effect, the ellipticity results from passage of circularly polarized light through the Kerr cell. For sinusoidally time varying electric fields applied to the Kerr cell, the optical retardation of the cell contains both steady and alternating components. These components are separated in the frequency structure of the electrical photoresponse. In this application the method may be used to discriminate against effects of light intensity fluctuations and small residual birefringence in windows. This permits measurement of the Kerr effect in materials having very small Kerr constants. (Author)

AD-750 758 PC$3.00/MF$0.95
Arizona Univ Tucson Optical Sciences Center
APPLICATION OF ASPHERICS FOR WEIGHT REDUCTION IN SELECTED CATADIOPTRIC LENSES.
Technical rept.,
Richard A. Buchroeder. Jul 71, 54p Rept no. TR-69
Contract N00039-69-C-0554

Descriptors: (*Aspherical lenses, Design), Telescopes, Night vision, Patents, Tolerances (Mechanics), Optical properties, Computer programs, Specifications.
Identifiers: Cassegrain telescopes, Catadioptric systems, Low light level viewing.

The history of modern wide-field, high-speed catadioptric lenses is reviewed. One system comprising only spherical curves and representative of the current art for low-light-level systems is evaluated and used as a baseline design in a weight-reduction study. Five aspheric designs are computed and evaluated. It is found that the use of aspherics will permit weight reduction only in certain instances, i.e., if one element of an all-spherical design can be eliminated or if a fundamentally different configuration that is possible only with aspherics is substituted for the all-spherical configuration. Of these possibilities, the elimination of an element is the best replacement for the baseline design. The case of a highly constrained, purely refractive triplet is studied in some detail. Four designs are computed-from the all-spherical case to the most complex polynomial aspheric. (Author)

AD-750 788 PC$3.00/MF$0.95
Technische Hochschule Darmstadt (West Germany) Lehrstuhl Fuer Angewandte Physik
SPARK LIGHT PULSES OF EXTREMELY SHORT DURATION.
Final scientific rept. 1 Feb 68-31 Jan 72,
Heinz Fischer. Jul 72, 23p AFCRL-72-0537
Contract F61052-68-C-0039

Descriptors: (*Flash lamps, Design), Gas discharges, Electric arcs, Light pulses, West Germany.

Nanolites, spark channels that produce intense light flashes of very short duration, were investigated to obtain a physical understanding of how their characteristics could be adjusted. After designing a spark circuit that gave maximum current rise, a set of nanolites of different capacities were constructed to stand the various steps of the spark breakdown. The high resistance prechannel was found to be transparent and subnanosecond light pulses produced by such prechannels closely followed the shape of the current pulse. (Author)

AD-750 803 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
NARROW BAND FILTERS BASED ON MAGNETOOPTICAL EFFECTS,
J. M. Beckers. 25 Aug 69, 7p Rept no. AFCRL-72-0513
Availability: Pub. in Applied Optics, v9 p595-599 Mar 70.

Descriptors: (*Optical filters, Magneto-optic effect), Magnetic fields, Light transmission, Line spectrum, Zeeman effect, Solar spectrum.

The theory is developed for two types of narrow band filters. One is based on the Zeeman splitting of the line absorption coefficient; the other is based on the splitting of the anomalous dispersion curves in a Zeeman multiplet. The latter type filter is very similar to the Lyot-Ohman filter. It uses however the Macaluso-Corbino effect instead of the linear birefringence of crystals. It is capable of giving very much narrower transmission profiles than the Lyot-Ohman filter and it has a very wide field. (Author)

N72-28466 PC$3.00/MF$0.95
Perkin-elmer Corp., Norwalk, Conn. Optical Group.
EVALUATION OF THE THIN DEFORMABLE ACTIVE OPTICS MIRROR CONCEPT.
H. J. Robertson. Jun 72, 144p NASA-CR-2073, ER-10859
Contract NAS1-9759

Descriptors: *Deformation, *Mirrors, *Optics, Astronomical telescopes, Diffraction, Performance prediction.

For abstract, see STAR 10 19.

N72-28694 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
TRANSMITTING AND REFLECTING DIFFUSERS.
Patent Application
L. S. Keafer, Jr., E. E. Burcher, and L. P. Kopia. 30 Mar 72, 9p NASA-CASE-LAR-10385-2, US-PATENT-APPL-SN-239803
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Diffusion, *Light transmission, *Ultraviolet radiation, Bouguer law, Patent applications, Silicon dioxide, Wave reflection.

For abstract, see STAR 10 19.

N72-28696 PC$3.00/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
ELECTRO-OPTICAL SCANNING APPARATUS.
Patent Application
F. C. Billingsley, and J. J. Volkoff. 16 Mar 72, 19p NASA-CASE-NPO-11106-2, US-PATENT-APPL-SN-235225
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Electro-optics, *Scanning, *Transmittance, Luminous intensity, Patent applications, Transmissivity.

For abstract, see STAR 10 19.

N72-28717 PC$10.25/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
A CATALOGUE OF NORMALIZED INTENSITY FUNCTIONS AND POLARIZATION FROM A CLOUD OF PARTICLES WITH A SIZE DISTRIBUTION OF ALPHA TO THE MINUS 4TH POWER.
P. D. Craven, and G. A. Gary. 7 Feb 72, 164p NASA-TM-X-64674

Descriptors: *Mie scattering, *Spheres, Particle size distribution, Polarization (waves).

For abstract, see STAR 10 19.

Pat-Appl-266943 PC$3.00/MF$0.95
Space Sciences, Inc., Natick, Mass.
DOPPLER SHIFT SYSTEM.
Patent Application
S. Aisenberg. Filed 28 Jun 72, 19p NASA-CASE-HQN-10740-1
Contract NASW-1703
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Doppler effect, *Velocity measurement, Fabry-perot interferometers, Patent applications.

A system for measuring velocities of radiating particles based on the Doppler shift is disclosed. Light from the particles is directed through a narrow band optical filter to a Fabry-Perot interferometer initially tuned to a selected center line corresponding to zero particle Doppler shift. The movable mirror of the interferometer is made to sweep about the center line by the output of a modulation oscillator. The fringe pattern output is projected onto a pin hole through which light is directed to a photomultiplier. The output of the photomultiplier is supplied to a phase-sensitive detector which is supplied with the oscillator output as a reference signal. The detector output is gain-controlled and

is combined with the oscillator output to adjust the interferometer's movable mirror to attain the line center.

N72-29687 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE MOLECULAR BRANCHING RATIO METHOD FOR CALIBRATION OF OPTICAL SYSTEMS IN THE VACUUM ULTRAVIOLET.
M. J. Mumma. Jul 72, 29p NASA-TM-X-65975, X-691-72-245
Subm- Submitted for Publication

Descriptors: *Branching (physics), *Far ultraviolet radiation, *Molecular theory, *Optical equipment, Bibliographies, Spectral bands, Spectral resolution.

For abstract, see STAR 10 20.

N72-29716 PC$9.50/MF$0.95
Max-planck-institut Fuer Physik Und Astrophysik, Munich (West Germany).
TABLES OF MIE SCATTER FUNCTIONS. PART 2 MIXTURES OF ABSORBING PARTICLES . TABELLEN VON MIE-STREUFUNKTIONEN. TEIL 2 GERMISCHE ABSORBIERENDER TEILCHEN.
R. H. Giese. Dec 71, 146p
MPI-PAE/EXTRATERR-58

Descriptors: *Mie scattering, *Particle size distribution, *Scattering functions, Computer programming, Mixtures, Refractivity, Tables (data).

For abstract, see STAR 10 20.

N72-30399 PC$4.00/MF$0.95
Parametrics, Inc., Waltham, Mass.
DESIGN, FABRICATION AND CALIBRATION OF ALPHA PARTICLE DENSITOMETERS FOR MEASURING PLANETARY ATMOSPHERIC DENSITY.
Final Report, Jan. 1970 - May 1972
B. Sellers, J. L. Hunerwadel, and F. A. Hanser.
May 72, 40p NASA-CR-112116
Contract NAS1-9731

Descriptors: *Atmospheric density, *Densitometers, *Mars atmosphere, *Systems engineering, Calibrating, Density measurement, Equipment specifications.

For abstract, see STAR 10 21.

20G. Particle Accelerators

AD-750 523 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
METHODS FOR DESIGNING THE ELECTROMAGNET OF A BETATRON ON AN ASSIGNED VALUE OF INTENSITY OF RADIATION,
V. P. Belyaev, A. A. Vorobev, V. A. Vorobev, V. I. Gorbunov, and G. A. Kunitsyn. 18 Aug 72, 16p
Rept no. FTD-HT-23-366-72
Edited trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Elektromekhanika (USSR) n1 p38-43 1971, by Charles T. Ostertag, Jr.

Descriptors: (*Betatrons, Electromagnets), (*Electromagnets, Design), Bremsstrahlung, Radiation chemistry, Dose rate, Gamma emission, USSR.
Identifiers: Translations, Computer aided design.

A method of calculation is proposed, using a computer, which makes it possible to plan betatrons with assigned values of individual parameters and an optimum combination of all the remaining characteristics of the installation in the energy range of accelerated electrons of 5-50 MeV. This range of energies of accelerated electrons includes practically all the possible cases of use of betatrons which are of practical interest. (Author)

20H. Particle Physics

AD-750 311 PC$3.00/MF$0.95
Army Natick Labs Mass
ON THE THEORY OF STOPPING OF FAST CHARGED PARTICLES,
Ari Brynjolfsson. 1972, 14p

Descriptors: (*Charged particles, Shielding), (*Shielding, Theory), Electron density, Ionization potentials, Statistical mechanics, Quantum mechanics, Atoms, Damping, Aluminum, Hydrogen, Cerenkov radiation.

AD-750 566 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
CROSS SECTIONS AND ANGULAR DISTRIBUTIONS FOR THE D - D REACTION FROM 300- -700 KEV,
A. W. Barrows, Jr., N. Ying, B. K. Barnes, and B. Cox. Aug 72, 47p Rept no. BRL-1603

Descriptors: (*Deuteron reactions, Neutron cross sections), Helium, Hydrogen, Neutron scattering, Curve fitting, Graphics.

Relative cross sections have been measured for the D (d,p)3H and D (d,n)3He reactions from 300 keV to 700 keV in 50 keV steps. The ralative values have been normalized to existing cross sections in order to obtain absolute values. Angular distributions of all charged particles from the reactions were taken from 20 degrees to 160 degrees in 10 degree intervals in the laboratory system. Energy dependent asymmetry coefficients from the expansions of the center-of-mass angular distributions in terms of even powers of Cos theta are obtained as are the branching ratios between the two reaction modes. The different energy dependences of the moments of the two cross sections are discussed in relation to existing theories. (Author)

AD-751 002 Reprint
Institute for Advanced Study Princeton N J
ARE THERE FIXED SINGULARITIES IN (T SUB 1),
Anthony Zee. 15 Feb 72, 6p AFOSR-TR-72-2040
Grant AF-AFOSR-1866-70
Availability: Pub. in Physical Review Letters D, v5 n11 p2829-2832, 1 Jun 72.

Descriptors: (*Elementary particles, Regge poles), Nuclear scattering, Dispersion relations, Matrix algebra, Nuclear spins.
Identifiers: Current algebras, Quarks.

Nonforward scaling and the light-cone commutator are shown to require the existence of a Kronecker delta term in (T sub 1). The present data may be consistent with the possibility that this Kronecker delta term vanishes at t = 0 and (q sup 2) = -infinity. Analyticity implies a connection between scaling behavior and Regge behavior. (Author)

AD-751 003 Reprint
Institute for Advanced Study Princeton N J
COHERENT PRODUCTION, LOW-ENERGY THEOREMS, AND ANOMALOUS WARD IDENTITIES,
Anthony Zee. 9 Mar 72, 11p AFOSR-TR-72-2046
Grant AF-AFOSR-1866-70

Descriptors: (*Pions, Nuclear scattering), Nuclear models, Interactions, Matrix algebra, Differential cross section, Integration.
Identifiers: Axial vector current, Ward identities, Electromagnetic interactions, SU3 theories.

The significance of two low-energy theorems relating pion to 2 gammas, gamma to 3 pions, and 2 gammas to 3 pions is stated. The processes pions (+,-) + (Z,A) to (Z,A) + pions (+,-) + pion (0), e (+) e (-) 3 pions, and e (+) e (-) to 3 pions are discussed as experiments providing a check on these theorems. Some rate estimates are given. (Author)

JPRS-57175 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
THE FORMATION OF SCANDIUM-46 DURING THE IRRADIATION OF CALCIUM IN HIGH- -ENERGY NEUTRON BEAMS,
V. I. Levin, A. B. Malinin, and L. N. Kurchatova. 4 Oct 72, 10p
Trans. of Radiokhimiya (USSR) n3 p447-450 1972.

Descriptors: (*Calcium isotopes, *Neutron beams), (*Scandium isotopes, Isotope availability), Neutron irradiation, Neutron reactions, Gamma emission, Translations, USSR.
Identifiers: *Scandium 46, Calcium 45.

The report contains a description of a process for irradiating calcium targets in high-energy neutron beams. (Author)

N72-28711 PC$3.25/MF$0.95
Oak Ridge National Lab., Tenn. Neutron Physics Div.
DIFFERENTIAL CROSS SECTIONS AT FORWARD ANGLES FOR HYDROGEN AND HELIUM PARTICLES FROM 62 MEV PROTONS INCIDENT ON NI-60.
R. W. Peelle, and F. E. Bertrand. Jun 71, 24p
NASA-CR-127473, ORNL-4698
Contract NASA ORDER L-12186, W-7405-ENG-26

Descriptors: *Nickel isotopes, *Particle production, *Proton irradiation, *Scattering cross sections, Alpha particles, Deuterons, Helium isotopes, Iron isotopes, Protons, Tritons.

For abstract, see STAR 10 19.

N72-28718 PC$7.75/MF$0.95
Western Ontario Univ., London. Dept. of Physics.
ELASTIC AND INELASTIC SCATTERING OF POSITRONS IN GASES AND SOLIDS.
Annual Report, 1 Apr. 1971 - 31 Mar. 1972
J. W. Mcgowan. 31 Mar 72, 113p
NASA-CR-122504
Contract NGR-52-029-006
Subm- Sponsored By Natl. Res. Council

Descriptors: *Equipment specifications, *Positrons, *Scattering, Gases, Solids, Thermalization (energy absorption).

For abstract, see STAR 10 19.

N72-28723 PC$3.50/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
QUANTUM MECHANICS AS RELATIVISTIC STATISTICS (THE CASE OF INTERACTING PARTICLES).
Y. A. Rylov. Jul 72, 30p NASA-TT-F-14372, PR-86
Tran- Transl. Into English From Kvantovaya Mekhanika Kak Relyativistikaya Statistika (Sluchay Dvukh Vzaimodeystvuyushikh Chastits)Chasty 2, Inst. of Space Res., Acad. of Sci., Moscow, Report Pr-86, 1971 31 P

Descriptors: *Nonrelativistic mechanics, *Particle interactions, *Quantum mechanics, Electromagnetic fields.

For abstract, see STAR 10 19.

N72-28727 PC$3.00/MF$0.95
Greyrad Corp., Princeton, N.J.

SPECTROCOPIC MEASUREMENTS OF WATER VAPOR PLASMAS AT HIGH RESOLUTION THE OPTICAL TRANSITION PROBABILITIES FOR OH (A 2 SIGMA - X 2 PI).
L. Klein. Aug 72, 151p NASA-CR-2069
Contract NAS3-13424

Descriptors: *Hydroxyl emission, *Molecular energy levels, *Spectroscopic analysis, *Transition probabilities, *Water vapor, Absorption spectra, Atomic energy levels, Emission spectra, Hydrogen, Plasma diagnostics, Ultraviolet spectra.

For abstract, see STAR 10 19.

N72-28734 PC$5.50/MF$0.95
Rome Univ. (Italy). Inst. of Physics.
ELECTROPRODUCTION OF PIONS AT LOW ENERGIES.
E. Amaldi. 9 Jul 71, 69p NOTA-INTERNA-326
Conf- Presented At the Seminar on Electromagnetic Interactions, Trieste, Italy, 21-26jun. 1971

Descriptors: *Coincidence circuits, *Electron scattering, *Inelastic scattering, *Particle production, *Pions, Nucleons, Photon-electron interaction, Scattering cross sections.

For abstract, see STAR 10 19.

N72-29705 PC$4.25/MF$0.95
Alabama A + M Univ., Normal. Dept. of Physics.
A COMPUTER CODE FOR PREDICTING GAMMA PRODUCTION CROSS SECTIONS BY NEUTRON INELASTIC SCATTERING FROM LIGHT NUCLEI.
Final Report
M. C. George. Jun 72, 45p NASA-CR-127781
Contract NGR-01-001-007

Descriptors: *Gamma rays, *Neutron scattering, *Nuclei (nuclear physics), Computer programs, Inelastic collisions, Ionizing radiation, Oxygen, Theoretical physics.

For abstract, see STAR 10 20.

N72-29708 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Goddard Inst. for Space Studies, New York.
KINEMATIC DISTRIBUTIONS FOR ELECTRON PAIR PRODUCTION BY MUONS.
R. Linsker. 1972, 29p NASA-TM-X-68565, COO-3067 (2)-2
Subm- Supported in Part By Aec

Descriptors: *Electron mobility, *Muons, *Pair production, *Positrons, *Quantum electrodynamics, Charged particles, Electron decay rate, Electron emission, High energy electrons, Theoretical physics.

For abstract, see STAR 10 20.

N72-29709 PC$4.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE INTERACTION LENGTHS OF ENERGETIC PIONS AND PROTONS IN IRON.
H. Crannell, C. J. Crannell, H. Whiteside, J. F. Ormes, and M. J. Ryan. Jun 72, 38p
NASA-TM-X-65951, X-661-72-194
Contracts NGR-09-005-007, NGR-09-050-001
Subm- Submitted for Publication

Descriptors: *Elementary particle interactions, *Iron, *Pions, *Protons, Hadrons, High energy interactions, Length, Scintillation counters.

For abstract, see STAR 10 20.

N72-30618 PC$14.00/MF$0.95
Teledyne Brown Engineering, Huntsville, Ala. Science and Engineering.
NONELASTIC NUCLEAR REACTIONS AND ACCOMPANYING GAMMA RADIATION.
Final Report
R. Snow, H. R. Rosner, M. C. George, and J. D. Hayes. Sep 71, 237p NASA-CR-121023, SE-SSL-1407
Contract NAS8-25534

Descriptors: *Energy distribution, *Gamma rays, *Inelastic scattering, *Nuclear reactions, Computer programs, Continuum mechanics, Statistical analysis, Theoretical physics.

For abstract, see STAR 10 21.

N72-30626 PC$3.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ULTRAHIGH ENERGY PHOTONS, ELECTRONS, AND NEUTRINOS, THE MICROWAVE BACKGROUND, AND THE UNIVERSAL COSMIC-RAY HYPOTHESIS.
F. W. Stecker. Sep 72, 21p NASA-TM-X-66007, X-641-72-319
Subm- Submitted for Publication

Descriptors: *Black body radiation, *Cosmic rays, *Energy spectra, *Meson-nucleon interactions, *Pions, High energy electrons, High energy interactions, Neutrinos, Particle production, Photons.

For abstract, see STAR 10 21.

N72-30640 PC$3.75/MF$0.95
Rome Univ. (Italy). Inst. of Physics.
PION ELECTROPRODUCTION AT THRESHOLD.
G. Benfatto, F. Nicolo, and G. C. Rossi. 29 Mar 72, 33p NOTA-INTERNA-268

Descriptors: *Electron scattering, *Pions, Form factors, Gauge invariance, High energy interactions, Inelastic scattering, Nuclear magnetic resonance, Nucleons, Numerical analysis, Regge poles.

For abstract, see STAR 10 21.

N72-30641 PC$3.75/MF$0.95
Rome Univ. (Italy). Inst. of Physics.
PHENOMENOLOGICAL ANALYSIS OF SINGLE PION PHOTOPRODUCTION ON NEUTRON IN THE REGION OF P11, D13, AND S11 PION-NUCLEON RESONANCES . ANALISI FENOMENOLOGICA DELLA FOTOPRODUZIONE SINGOLA DI PIONI SU NEUTRONE NELLA REGIONE DELLE RISONANZE PIONE--NUCLEONE P11, D13, S11.
A. Proia, and F. Sebastiani. 17 Mar 72, 34p NOTA-INTERNA-363
LANG- IN ITALIAN ENGLISH SUMMARY

Descriptors: *Nuclear magnetic resonance, *Photoproduction, *Pions, Gamma rays, Multipoles, Neutrons, Polarization (spin alignment), Recoil protons, Scattering amplitude.

For abstract, see STAR 10 21.

N72-30642 PC$3.00/MF$0.95
Rome Univ. (Italy). Inst. of Physics.
A REPRESENTATION OF DIRECT PRODUCT OF SU (3) AND SU (3) CHIRAL ALGEBRA FOR BARYONS.
F. Buccella, F. Nicolo, and A. Pugliese. 6 Apr 72, 18p NOTA-INTERNA-369

Descriptors: *Baryons, *Chiral dynamics, *Group theory, *Mathematical models, *Theoretical physics, Coupling coefficients, Hadrons, Matrices (mathematics), Regge poles, Sum rules, Symmetry, Wave functions.

For abstract, see STAR 10 21.

N72-30643 PC$3.00/MF$0.95
Rome Univ. (Italy). Inst. of Physics.
HIGH ENERGY MEASUREMENTS OF TOTAL CROSS SECTIONS ON PROTON, BY DETECTING VERY LOW ENERGY NEUTRONS.
S. Dangelo, P. Monacelli, and F. Sebastiani. 7 Apr 72, 5p NOTA-INTERNA-370

Descriptors: *Absorption cross sections, *High energy interactions, *Neutron counters, *Protons, Deuterium, Neutron scattering, Neutron spectra, Neutrons, Pions, Polarization, Scintillation counters.

For abstract, see STAR 10 21.

20I. Plasma Physics

AD-750 375 PC$3.00/MF$0.95
Army Missile Command Redstone Arsenal Ala
LASER ASSISTED LOW ENERGY X-RAY FLASH GENERATION,
Romas A. Shatas, Thomas G. Roberts, Harry C. Meyer, and John D. Stettler. 1972, 17p

Descriptors: (*Plasma medium, Heating), (*X rays, Plasma medium), X-ray tubes, Lasers, Deuterium, Tritium, Electron density, Magnetohydrodynamics, Shock waves, Thermonuclear reactions, Energy conversion.
Identifiers: Nuclear fusion, Plasma heating, Laser produced plasmas.

In the paper, the authors analyze alternate methods for the soft x-ray pulse generation which rely on the unprecedented values of light flux attainable with high pulse energy lasers. For this purpose, in section 2 the authors outline some aspects of laser-plasma interaction pertinent to attainment of thermonuclear reaction temperatures. The authors note that presently considered techniques for x-ray generation from laser plasmas are based on inertial plasma confinement.

AD-750 433 Reprint
Massachusetts Inst of Tech Cambridge Francis Bitter National Magnet Lab
MAGNETIC-FIELD-ENHANCED HEATING OF PLASMAS WITH CARBON DIOXIDE LASERS,
Daniel R. Cohn, and Benjamin Lax. 4 May 72, 5p
AFOSR-TR-72-1985
Contract F44620-67-C-0047
Sponsored in part by National Science Foundation, Washington, D. C.
Availability: Pub. in Applied Physical Letters, v21 n5 p217-220, 1 Sep 72.

Descriptors: (*Plasma medium, Heating), Magnetic fields, Electron density, Ions, Gas lasers.
Identifiers: Plasma heating, Laser produced plasmas, Carbon dioxide lasers, Electron energy.

The effect of high magnetic fields upon the heating rate of CO2-laser-produced plasmas has been calculated. It is found that the inhibition of thermal losses in the presence of high magnetic fields should substantially enhance the effectiveness of the CO2 laser as a means of creating hot plasmas. Electron and ion temperatures are computed for plasmas produced with 10 to the power of 10-W CO2 lasers. (Author)

AD-750 477 PC$3.00/MF$0.95
Stanford Univ Calif Inst for Plasma Research
LOW FREQUENCY INSTABILITIES IN INHOMOGENEOUS MAGNETOPLASMA.
Final rept. 1 Jun 71-31 May 72,
Sidney A. Self, and Frederick W. Crawford. Jun 72, 19p Rept no. SU-IPR-483 AFOSR-TR-72-2006
Contract F44620-71-C-0076

Descriptors: (*Magnetohydrodynamics, Stability), Electric arcs, Magnetic fields, Electron density, Thermal properties, Argon, Low frequency.
Identifiers: Argon plasma, *Plasma instabilities, Electron energy, Q machines.

The research covers hollow cathode discharge (HCD) mechanisms and instabilities. Positive column theories of steady state magnetized discharges are extended to finite cylinder geometries by separation of variables. Low frequency instabilities in HCD's are identified as centrifugal flute modes driven by non-uniform E/Br rotation and stabilized by infinite Larmor radius effects. (Author)

AD-750 478 PC$3.00/MF$0.95
Stanford Univ Calif Inst for Plasma Research
LOW-FREQUENCY FLUTE INSTABILITIES OF A HOLLOW CATHODE ARC DISCHARGE: THEORY AND EXPERIMENT,
D. B. Ilic, T. D. Rognlien, S. A. Self, and F. W. Crawford. Jul 72, 49p Rept no. SU-IPR-482 AFOSR-TR-72-2009
Contract F44620-71-C-0076, Grant NGL-05-020-176

Descriptors: (*Plasma medium, *Electric arcs), Plasma oscillations, Stability, Electron density, Ions, Langmuir probes, Electric fields, Magnetic fields, Partial differential equations, Equations of motion, Numerical analysis, Magnetohydrodynamics.
Identifiers: Plasma diagnostics, Electron energy, Plasma instabilities.

The characteristics of two low-frequency electrostatic flute instabilities of a low-pressure hollow cathode arc discharge are reported. Mode 1 has azimuthal mode number m=1, and occurs when the radial electric field is negative (directed inwards) while Mode 2 has m=-1 and occurs when the field is positive. The radial electric field is controlled by varying the potential of a secondary anode cylinder located close to the outer discharge radius. A linear perturbation analysis, based on the two-fluid equations, is given for a low-beta, collisionless cylindrical plasma column, immersed in a uniform axial magnetic field, having a Gaussian density profile and an arbitrary radial electric field profile. Reasonable correlation between theory and experiment is demonstrated for both modes, by comparing the calculated and measured frequencies, mode numbers, and also the eigenfunctions of the density and potential fluctuations. (Author)

AD-750 524 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THEORY OF A PULSED PLASMOID ACCELERATOR,
A. A. Kulandin, D. M. Kazarnovskii, and A. V. Khoroshavin. 11 Aug 72, 11p Rept no. FTD-HT-23-517-72
Edited trans. of Magnitnaya Gidrodinamika (USSR) n2 p139-141 1970, by Paul J. Reiff, Jr.

Descriptors: (*Plasma accelerators, Theory), Plasma medium, Capacitors, Electrodes, Numerical analysis, USSR.
Identifiers: Translations.

The basic relationships involved in plasma acceleration are considered in addition to the main parameters of accelerators and their characteristics. A number of conclusions are drawn, the most important being that approximate formulae for the velocity, electode length and emf of the store give results close to those obtained by numerical solution of the accelerator equations. Formulae and graphs are obtained which simplify the problem of selecting the optimum combination of parameters for a given accelerator. (Author)

AD-750 553 PC$3.00/MF$0.95
Air Force Weapons Lab Kirtland AFB N Mex
A STUDY OF ELECTRON COLLISION FREQUENCY IN AIR MIXTURES AND TURBULENT BOUNDARY.
Technical rept. May 70-Mar 71,
Dennis W. Lankford. Oct 72, 67p Rept no. AFWL-TR-72-71

Descriptors: (*Plasma sheath, Electron density), (*Atmosphere entry, *Blackout (Electromagnetic)), (*Ablation, Plasma sheath), Phenolic plastics, Air, Aerodynamic heating, Graphics, Turbulent boundary layer, Reentry vehicles.
Identifiers: Collision cross sections.

The electron collision frequency is a critical parameter in determining the attenuation of electromagnetic signals transmitted through the plasma sheath surrounding advanced reentry vehicles. This study improves current methods of obtaining this parameter for multicomponent gas mixtures. A multicomponent collision frequency model is defined with temperature and species-dependent electron collision cross sections. A parametric study of collision frequency in a gaseous mixture of phenolic carbon and air is performed using this model, and the results are compared to calculations made using a constant cross-section, clean air model. A study of collision frequency and signal attenuation in turbulent boundary layers is performed using the multicomponent and constant cross-section models. This study shows that the multicomponent model can predict collisions frequencies in an ablation air mixture that are significantly different from those predicted by constant cross-section models. (Author)

AD-750 559 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
INVESTIGATION OF THE INFLUENCE OF THE CATHODE TYPE ON THE DEIONIZATION PROPERTIES OF A POWERFUL PULSE DISCHARGE IN MERCURY VAPOR,
N. N. Kempi, El K. Oreshnikova, Yu. M. Tarabasov, A. D. Khakhaev, and Yu. D. Khromov. 25 Aug 72, 10p Rept no. FTD-HT-23-854-72
Edited trans. of mono. Voprosy Fiziki Nizkotemperaturnoi Plazmy (Problems of Low-Temperature Plasma Physics) n.p., 1970 p217-219, by R. J. Zeccola.

Descriptors: (*Plasma medium, Gas discharges), (*Gas discharges, Mercury), Gas ionization, Electron density.
Identifiers: Translations, Electron energy, Ion density (Concentration).

The concentration of charged particles and the electronic temperature of discharge plasma obtained in an ignitron were determined by means of central probes. The research was conducted on the basis of different types of cathodes: liquid or film. The measurement results obtained in this work show that a film cathode is characterized by a higher rate of vapor formation due to the passage of current pulses than does the liquid cathode. (Author)

AD-750 657 PC$3.00/MF$0.95
Cornell Univ Ithaca N Y Lab of Plasma Studies
ROLE OF ION MOTION AND OF RETURN CURRENTS IN TRANSVERSE INSTABILITY OF COLLIDING PLASMAS.
Topical research rept.,
Isaiah Nebenzahl. May 71, 28p Rept no. LPS-72
Contract N00014-67-A-0077-0003

Descriptors: (*Plasma medium, Stability), (*Electron beams, Interactions), Ion beams, Magnetic pinch, Dispersion relations, Equations of motion.
Identifiers: Plasma instabilities, Vlasov equations.

Proper account of the ion dynamics is shown to lead to a significant change in the extent of the unstable range of transverse modes. However, no very high growth rates can be produced by the ions. For relativistic electron beams in a cold plasma, the role of return currents induced in the plasma and of plasma collisions are analyzed. The return currents do not influence the transverse instability except for the extreme relativistic region gamma (N sub b)/ (N sub p) > 1, where the plasma electrons 'take over' in maintaining the growth rate high. Collisions are unimportant unless their frequency nu>or= (omega sub p)squared (plasma)/ (omega sub p) (beam), where transverse oscillations cease to be electrically neutralized, so that pinching becomes impossible and the growth rate of the instability goes to zero like 1/nu. (Author)

AD-750 703 PC$5.25/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE EVOLUTION OF CHARGED PARTICLES FROM A POINT SOURCE IN THE FIELD OF A MAGNETIC DIPOLE,
E. K. Kolesnikov, and B. V. Filippov. 21 Jul 72, 62p Rept no. FTD-MT-24-74-72
Edited machine trans. of Leningrad Univ. Vestnik (USSR) v25 n7, Seriya Matematiki, Mekhaniki i Astronomii, n2 p88-120 1970, by Charles T. Ostertag, Jr.

Descriptors: (*Plasma medium, Particle trajectories), (*Charged particles, Magnetic fields), Dipole moments, Equations of motion, Distribution functions, Integration, Numerical analysis, USSR, Magnetic moments.
Identifiers: Translations.

In the article the spreading of charged particles from a point source in the field of a magnetic dipole is investigated. This work is based on the study of two famous integrals of equations of motion of charged particles in a dipole field. The equatorial injection of electrons and protons is examined. The power structure of forming radiating zone is investigated. The independence of boundaries of this zone on the value of magnetic dipole moment, on the charge, and on the mass of injecting particles is proved. (Author)

AD-750 715 PC$3.00/MF$0.95
Princeton Univ N J Plasma Physics Lab
RESEARCH ON PLASMA SIMULATION BY COMPUTER FOR STUDIES OF COLLISIONLESS SHOCKS AND PLASMA TURBULENCE.
Final rept.,
John M. Dawson. Nov 72, 5p
Contract N00014-67-A-0151-0021

Descriptors: (*Plasma medium, Simulation), Plasma oscillations, Electron density, Magnetic fields, Stability, Transport properties, Thermal radiation, Heating, Damping, Shock waves, Turbulence.
Identifiers: Computerized simulation, Vlasov equations, Plasma instabilities, Plasma heating, Ion acoustic waves.

The research dealt with the development of numerical techniques for simulating plasmas and the application of these techniques to solve important problems on the nonlinear and turbulent behavior of plasmas. A number of significant problems were solved on the anomalous absorption of intense radiation by plasma, and on the anomalous diffusion of plasma across a magnetic field. (Author)

AD-750 742 PC$3.00/MF$0.95
Aerospace Corp El Segundo Calif Lab Operations
THE INDUCTION ARC, A STATE-OF-THE ART REVIEW.
Rept. for Feb-Jun 72,
Hans U. Eckert. 31 Oct 72, 78p* Rept no. TR-0073 (3220-20)-2 SAMSO-TR-72-227
Contract F04701-72-C-0073

Descriptors: (*Plasma medium, *Electric arcs), Magnetic fields, Gas ionization, Argon, Transformers, Inductance, Radiofrequency, State-of-the-art reviews.
Identifiers: *Induction arcs, Electrodeless arc discharges, Argon plasma, Plasma diagnostics.

The induction arc is, in principle, a high-frequency transformer in which the secondary is formed by a

thermal plasma. Since its invention in 1961, this arc has been the subject of over 100 investigations with widely differing goals. Information contained in the literature up to 1972, covering history, experimental techniques, theory, and applications, has been collected and reviewed. Fair agreement between experimental and theoretical data indicates that heat balance and skin effect are the two basic processes governing the arc plasma. This agreement appears to be limited by nonequilibrium effects for which no provisions have been made in the theoretical models. The absence of contamination by electrode material makes the induction arc suitable for applications where a clean plasma is essential. The most important industrial application may be in plasma chemistry, provided such an arc can be operated more efficiently. A promising approach is low-frequency operation directly from the power line by means of a sufficiently large iron core. (Author)

AD-750 874 PC$3.00/MF$0.95
Air Force Cambridge Research Labs L G Hanscom Field Mass
EFFECT OF DIFFUSION ON LASER INDUCED BREAKDOWN OF GASES.
Physical sciences research papers,
Ronald L. Fante. 15 Aug 72, 21p Rept nos. AFCRL-72-0479, AFCRL-PSRP-506

Descriptors: (*Gas discharges, Lasers), (*Air, Gas discharges), Diffusion, Theory, Focusing, Heating.
Identifiers: Laser heating, Gaseous diffusion, Laser produced plasmas.

A variational method has been developed to account for the effect of diffusion on laser induced breakdown. The method is applicable for arbitrary distributions of intensity in the focal volume. It has been specifically applied to the calculation of breakdown for Gaussian spots, and found to yield breakdown intensities differing by nearly a factor of 2 from calculations employing simplified diffusion models. (Author)

AD-750 943 PC$3.00/MF$0.95
Stanford Univ Calif Inst for Plasma Research
ELECTRONIC NONEQUILIBRIUM IN A SUPERSONIC EXPANSION OF IONIZED GAS,
Douglas David McGregor. Jul 72, 284p Rept no. SU-IPR-474 AFOSR-TR-72-2049
Contract F44620-68-C-0051, Grant NSF-GK-4041

Descriptors: (*Plasma medium, Recombination reactions), (*Potassium, Electron transitions), Electron density, Gas flow, Supersonic nozzles, Excitation, Electric discharges, Curve fitting, Graphics, Atomic energy levels, Lasers.
Identifiers: Electron energy, Potassium plasma, Ion density (Concentration), Plasma diagnostics.

An experimental and analytical study of nonequilibrium among the populations of the excited levels of electric arc heated potassium vapor injected in argon/helium gas flows passing through a Mach 2.2 supersonic nozzle is presented. Spectroscopic measurements (line intensity and line reversal) of the gas were performed upstream of the nozzle and at the nozzle exit. As the plasma proceeded through the nozzle the gas temperature dropped from 2500K to 1000K in 0.00003 seconds. The electron temperature also decreased rapidly, causing the free electrons to recombine with ions of potassium. The recombined electrons passing through the energy level structure of potassium formed the basis of the electronic nonequilibrium. A theory was written describing quantitatively the behavior of the excited atom populations. The electronics populations of expanded potassium vapor were observed to depart from equilibrium in qualitative accordance with the theoretical predictions. (Author)

AD-750 961 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
DISTORTION OF ENERGY DISTRIBUTION FUNCTION OF ELECTRONS MEASURED WITH CYLINDRICAL PROBE,
A. I. Lukovnikov, and M. Z. Novgorodov. 29 Aug 72, 11p Rept no. FTD-HC-23-0976-72
Unedited rough draft trans. of Akademiya Nauk SSSR. Fizicheskii Insititut. Kratkie Soobshchenie po Fizike, n1 p27-34 1972.

Descriptors: (*Plasma medium, Probes (Electromagnetic)), Diffusion, Integral equations, Electrons, Energy, Distribution functions, USSR.
Identifiers: Translations, *Electron energy, Plasma diagnostics.

It is caused by the fact that the energy distribution function of electrons on the surface of the probe is different from the distribution function in an unexcited plasma.

AD-750 993 Reprint
Stanford Univ Calif Inst for Plasma Research
STEADY-STATE THEORY OF A DISCHARGE COLUMN IN A MAGNETIC FIELD: SEPARABLE SOLUTIONS FOR A FINITE CYLINDER,
D. B. Ilic, and S. A. Self. 17 Jan 72, 4p AFOSR-TR-72-2070
Contract F44620-71-C-0076
Availability: Pub. in Jnl. of Applied Physics, v43 n6 p2620-2623 Jun 72.

Descriptors: (*Gas discharges, Magnetic fields), Electron density, Ions, Diffusion.

The problem of the steady state of a magnetized discharge of the positive column type, in the case of a finite cylinder, is shown to have separable solutions for the radial and axial dependence of plasma density, potential, and electron and ion velocities. Consequently, the results of the corresponding one-dimensional theory may be directly applied to the two-dimensional case. In particular the theory is applicable to the case of a low-pressure discharge in a strong magnetic field, where the radial flow is collision dominated but the axial motion is collisionless. (Author)

COM-72-11368 Reprint
National Oceanic and Atmospheric Administration, Boulder, Colo. Aeronomy Lab.
NONLINEAR THEORY OF DENSITY FLUCTUATIONS IN TURBULENT PLASMAS,
Arthur M. Sleeper, and Jerome Weinstock. 24 Jan 72, 9p NOAA-72091606
Pub. in Physics of Fluids, v15 n8 p1507-1514 Aug 72.

Descriptors: (*Plasmas (Physics), Turbulence), Electron density (Concentration), Particle collisions, Magnetosphere, Dispersion relations.
Identifiers: Plasma instabilities.

The level of rms density fluctuations in a turbulent plasma, saturated by modified particle orbits, are theoretically found to obey a remarkably general, but simple, formula. The results are obtained independently of the form of the dispersion relation and are therefore applicable to turbulence arising from a broad class of instabilities. The restrictions on the ratios between gyro, collision, and mode frequencies are explicitly given. Both the collisional and collisionless cases are discussed, and shown to be consistent with a variety of experiments. (Author)

N72-28705 PC$3.00/MF$0.95
Nagoya Univ. (Japan). Inst. of Plasma Physics.
STOCHASTIC CHARACTER OF ELECTRON CYCLOTRON HEATING IN A NONUNIFORM MAGNETIC FIELD.
T. Kawamura, C. Namba, and Y. Terashima. Apr 72, 12p IPPJ-123

Descriptors: *Electrons, *Heating, *Stochastic processes, Magnetic mirrors, Radio frequencies.

For abstract, see STAR 10 19.

N72-28743 PC$4.50/MF$0.95
Aeronautical Research Associates of Princeton, Inc., N J.
RESEARCH ON PLASMA TURBULENCE INVOLVING BINARY PARTICLE COLLISIONS AND COLLECTIVE EFFECTS.
Final Report
G. Sandri. May 72, 50p NASA-CR-127479
Contract NASW-2352

Descriptors: *Particle collisions, *Plasma diagnostics, *Plasma turbulence, Binary systems (materials), Liouville theorem, Lorentz gas, Mathematical models, Partial differential equations.

For abstract, see STAR 10 19.

N72-28744 PC$8.50/MF$0.95
Stanford Univ., Calif. Inst. for Plasma Research.
A STUDY OF OPTICAL SCATTERING METHODS IN LABORATORY PLASMA DIAGNOSIS.
C. R. Phipps, Jr. Mar 72, 126p NASA-CR-127454, SU-IPR-462
Contract NGL-05-020-277

Descriptors: *Electron energy, *Penning discharge, *Thomson scattering, *Velocity distribution, Hydrogen plasma, Lasers, Magnetic fields, Plasma diagnostics.

For abstract, see STAR 10 19.

N72-28745 PC$8.50/MF$0.95
Electrotechnical Lab., Tokyo (Japan).
NUMERICAL SOLUTION OF DISPERSION EQUATION FOR A BI-MAXWELLIAN PLASMA.
M. Kito. Dec 71, 128p RR-723
LANG- IN JAPANESE ENGLISH SUMMARY

Descriptors: *Boundary value problems, *Numerical analysis, *Plasma physics, Magnetic fields, Maxwell equation, Roots of equations, Vlasov equations, Wave dispersion.

For abstract, see STAR 10 19.

N72-28747 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HALL CURRENT EFFECTS IN THE LEWIS MAGNETOHYDRODYNAMIC GENERATOR.
L. D. Nichols, and R. J. Sovie. Jul 72, 27p NASA-TM-X-2606, E-6924

Descriptors: *Hall effect, *Plasma generators, *Vaporizing, Argon plasma, Electric current.

For abstract, see STAR 10 19.

N72-28748 PC$7.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
CALCULATION PROCEDURE, OPTIMIZATION AND COST FACTORS OF NORMAL-CONDUCTIVE, CRYOGENIC AND SUPERCONDUCTING MAGNETS FOR EXPERIMENTAL PLASMA PHYSICS.
B. Oswald. Jul 72, 100p NASA-TT-F-14340, IPP-4/96
Contract NASW-2035
Tran- Transl. Into English of Max-planck-inst. Fuer Plasmaphys. Rept. Ipp-4/96, Nov. 1971 P 1-76

Descriptors: *Cost analysis, *Magnets, *Optimization, Cryogenic magnets, Linear accelerators, Nuclear fusion, Superconducting magnets, Toroidal plasmas.

For abstract, see STAR 10 19.

N72-28749 PC$3.50/MF$0.95
Nagoya Univ. (Japan). Inst. of Plasma Physics.

ION CYCLOTRON WAVE GENERATION IN A TWO ION PLASMA.
H. Toyama, and K. Matsuura. May 72, 27p IPPJ-124

Descriptors: *Coupling, *Ion cyclotron radiation, *Plasma density, Cold plasmas, Optimization, Wave dispersion.

For abstract, see STAR 10 19.

N72-28750 PC$3.00/MF$0.95
Nagoya Univ. (Japan). Inst. of Plasma Physics.
HYBRID RESONANCE DUE TO TWO-ION SPECIES IN A PLASMA.
H. Toyama. May 72, 14p IPPJ-125

Descriptors: *Hydrogen ions, *Plasma resonance, Hydrogen atoms, Hydrogen plasma, Molecular ions.

For abstract, see STAR 10 19.

N72-28751 PC$3.50/MF$0.95
Nagoya Univ. (Japan). Inst. of Plasma Physics.
INHOMOGENEOUS EFFECT ON COIL TO PLASMA COUPLING IN ION CYCLOTRON WAVE.
H. Toyama, and K. Matsuura. Jun 72, 28p IPPJ-126

Descriptors: *Inhomogeneity, *Ion cyclotron radiation, *Plasma control, *Plasma density, Energy absorption, Plasma heating, Q devices, Radio frequencies.

For abstract, see STAR 10 19.

N72-28752 PC$4.00/MF$0.95
Nagoya Univ. (Japan). Inst. of Plasma Physics.
NONLINEAR MODULATION OF PLASMA WAVES.
M. Kako. Jun 72, 39p IPPJ-128

Descriptors: *Carrier waves, *Cold plasmas, *Perturbation, *Plasma waves, Magnetic fields, Modulation.

For abstract, see STAR 10 19.

N72-29285 PC$5.75/MF$0.95
Princeton Univ., N.J. Dept. of Aerospace and Mechanical Sciences.
HOLLOW CATHODE, QUASI-STEADY MPD ARC.
N. Parmentier, and R. G. Jahn. Dec 71, 71p NASA-CR-127749, REPT-1023
Contract NGL-31-001-005

Descriptors: *Arc discharges, *Hollow cathodes, *Plasma accelerators, *Plasma dynamics, Electric potential, Gas dynamics, Pressure.

For abstract, see STAR 10 20.

N72-29286 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
PERFORMANCE AND OPERATING CHARACTERISTICS OF THE ARC-DRIVEN LANGLEY 6-INCH SHOCK TUBE.
J. E. Nealy. Aug 72, 28p NASA-TN-D-6922, L-8312

Descriptors: *Performance tests, *Shock tubes, Electric arcs, Electrical measurement, Gas mixtures, High temperature gases, Pressure measurements.

For abstract, see STAR 10 20.

N72-29288 PC$3.00/MF$0.95
California Univ., Los Angeles. Plasma Physics Group.
CURRENT DRIVEN ELECTROSTATIC AND ELECTROMAGNETIC ION CYCLOTRON INSTABILITIES.
D. W. Forslund, C. F. Kennel, and J. M. Kindel. Feb 71, 17p NASA-CR-127752, R-87
Contracts NGL-05-007-190, N00014-69-A-0200-4023

Descriptors: *Current distribution, *Electromagnetic radiation, *Electrostatic waves, *Ion cyclotron radiation, *Magnetohydrodynamic stability, Growth, Magnetic fields, Rates (per time).

For abstract, see STAR 10 20.

N72-29289 PC$3.50/MF$0.95
California Univ., Los Angeles. Dept. of Physics.
SPATIAL CYCLOTRON DAMPING.
C. L. Olson. Sep 70, 30p NASA-CR-127770, R-78
Contracts NGR-05-007-190, N00014-69-A-0200-4023

Descriptors: *Collisionless plasmas, *Cyclotrons, *Electron energy, *Plasma physics, Electric fields, Excitation, Magnetic fields, Numerical analysis.

For abstract, see STAR 10 20.

N72-29707 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
VACUUM ULTRAVIOLET LINE RADIATION MEASUREMENTS OF A SHOCK-HEATED NITROGEN PLASMA.
J. O. Mcclenahan. Aug 72, 35p NASA-TN-D-6920, A-4234

Descriptors: *Far ultraviolet radiation, *Hypersonic reentry, *Line spectra, *Nitrogen plasma, *Radiation measurement, Computer programs, Radiant flux density, Shock waves.

For abstract, see STAR 10 20.

N72-29717 PC$4.50/MF$0.95
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics.
COLLECTIVE PHENOMENA IN A PENNING DISCHARGE IN A STRONGLY INHOMOGENEOUS MAGNETIC FIELD.
N. Hopfgarten, R. B. Johansson, B. H. Nilsson, and H. Persson. May 72, 50p TRITA-EPP-72-13

Descriptors: *Electric fields, *Ion sources, *Magnetic fields, *Penning discharge, Collisionless plasmas, Experimental design, Ion sheaths, Magnetic mirrors, Magnetosphere, Plasma waves.

For abstract, see STAR 10 20.

N72-29722 PC$4.00/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
PRESSURE AND CURRENT EFFECTS ON THE THERMAL EFFICIENCY OF AN MPD ARC USED AS A PLASMA SOURCE.
T. J. Pivirotto. 10 Jul 72, 36p NASA-CR-127758
Contract NAS7-100
Subm- Backup Document for Aiaa Synoptic Scheduled for Publication in Aiaa Journal on Jan. 1973

Descriptors: *Magnetohydrodynamics, *Plasma propulsion, *Pressure effects, *Thermodynamic efficiency, Electric arcs, Magnetic fields, Plasma physics.

For abstract, see STAR 10 20.

N72-30639 PC$3.00/MF$0.95
Fom-instituut Voor Plasmafysica, Jutphaas (Netherlands).
APPROXIMATE CROSS SECTIONS AND RATE COEFFICIENTS FOR IONIZATION, EXCITATION AND RECOMBINATION OF HYDROGENIC IONS AND ATOMS.
R. Mewe. Jul 70, 15p REPT-70-61
Subm- Sponsored in Part By Neth. Organ. for Pure Sci. Res. (Zwo)and Euratom

Descriptors: *Cross sections, *Electron-ion recombination, *Inelastic collisions, *Reaction kinetics, Atomic spectra, Excitation, Hydrogen plasma, Ion production rates, Maxwell-boltzmann density function, Plasma radiation.

For abstract, see STAR 10 21.

N72-30649 PC$8.50/MF$0.95
Princeton Univ., N.J. School of Engineering and Applied Science.
PULSED ELECTROMAGNETIC GAS ACCELERATION.
Semiannual Report, 1 Jul. - 31 Dec. 1971
R. G. Jahn, W. F. Vonjaskowsky, and K. E. Clark. Jan 72, 130p NASA-CR-127863, SAR-634R
Contract NGL-31-001-005

Descriptors: *Electromagnetic fields, *Exhaust gases, *Flow velocity, *Gas discharges, *Plasma jets, Arc discharges, Argon plasma, Electromagnetic pulses, Hollow cathodes.

For abstract, see STAR 10 21.

N72-30650 PC$3.00/MF$0.95
Mississippi State Univ., State College. Dept. of Aerophysics and Aerospace Engineering.
THEORETICAL MODELS AND NUMERICAL STUDIES OF WAVES IN A THREE-FLUID MEDIUM.
D. L. Murphree. Jun 72, 287p NASA-CR-2071
Contracts NGL-25-001-032, NGL-25-001-028

Descriptors: *Iterative solution, *Mathematical models, *Plasma diagnostics, *Wave dispersion, *Wave propagation, Atmospheric models, Computer programs, Ibm 360 computer, Ionosphere, Magnetic fields, Matrices (mathematics), Pi/1.

For abstract, see STAR 10 21.

N72-30655 PC$4.00/MF$0.95
Illinois Univ., Chicago. Dept. of Energy Engineering.
MAGNETOHYDRODYNAMIC GENERATOR EXPERIMENTAL STUDIES.
E. S. Pierson. 12 Jun 72, 36p NASA-CR-127891
Contracts NAS7-100, JPL-952985
Subm- Prepared for Jpl

Descriptors: *Liquid flow, *Magnetohydrodynamic flow, *Magnetohydrodynamic generators, *Structural design, Liquid potassium, Liquid sodium, Magnetic charge density, Magnetic flux, Magnetic induction.

For abstract, see STAR 10 21.

N72-30668 PC$3.00/MF$0.95
Institut Franco-allemand de Recherches, St. Louis (France).
DIAGNOSTICS OF TURBULENCES. PART 1 VISUALIZATION . DIAGNOSTIC DES TURBULENCES. 1ERE PARTIE VISUALISATIONS.
P. Smigielski, F. Albe, H. Fagot, and R. L. Oudin. 15 Nov 71, 17p ISL-38/71
Conf- Presented At the 8th Assoc. Franc. des Ingr. Et Techniciens de Laeron. Et de Lespace Colloq. on Aerodynamique Appl., St. Louis, France, 8-10 Nov., 1971

Descriptors: *Flow visualization, *Holography, *Hypersonic wakes, *Turbulent flow, Differential interferometry, Laser modes, Light scattering, Plasma diagnostics, Reflected waves, Schlieren photography.

For abstract, see STAR 10 21.

N72-30671 PC$7.75/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Brunswick (West Germany). Abteilung Elektrische Antriebe.
ON THE DIAGNOSTICS OF NITROGEN PLASMA JETS IN THERMODYNAMIC NONEQUILIBRIUM . ZUR DIAGNOSTIK VON STICKSTOFF-PLASMASTRAHLEN IM THERMODYNAMISCHEN NICHTGELICHGEWICHT.
Ph.D. Thesis - Brunswick Univ.
U. W. Sprengel. Apr 72, 111p DLR-FB-72-36
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Electron energy, *Nitrogen, *Nonequilibrium conditions, *Plasma diagnostics, *Thermodynamic equilibrium, Diagrams, Enthalpy, Entropy, Gas dissociation, High temperature, Plasma jets, Stagnation point.

For abstract, see STAR 10 21.

PB-212 570 PC$3.00/MF$0.95
Towne School of Civil and Mechanical Engineering, Philadelphia, Pa.
THEORY OF THE CONSTANT PROPERTY ARC,
Alan M. Whitman, and Ira M. Cohen. Sep 72, 23p 2281/8
Grant NSF-GK-2281

Descriptors: (*Gas discharges, *Electric arcs), Electrical resistivity, Thermal conductivity, Gas ionization.

The canal model for arc discharges is examined and shown to yield a unique, consistent solution when the canal boundary temperature T is specified as a gas property. Electrical and thermal conductivities are taken as constants appropriate to T. Solutions are obtained for both cylindrical and planar arc columns. Both are qualitatively similar and show a distinct minimum in the current-electric field characteristic. This is attributed to the competition between the growing arc diameter with current and the increasing conduction to the wall of the dissipated energy. Favorable comparison is shown between this simple model and more exact calculations for arc discharges. (Author)

20J. Quantum Theory

AD-750 482 PC$3.00/MF$0.95
Brandeis Univ Waltham Mass Dept of Physics
AERODYNAMICS OF GASES AND INTERACTION WITH RADIATION.
Final technical rept. 1 Nov 67-14 Feb 72,
Eugene P. Gross. Oct 72, 13p AFOSR-TR-72-1976
Grant AF-AFOSR-1370-68

Descriptors: (*Quantum mechanics, Reports), (*Kinetic theory, Reports), Gases, Interactions, Field theory, N-body problem, Perturbation theory, Solid state physics, Transport properties, Calculus of variations, Superfluidity, Plasma physics, Liquefied gases, Helium, Phonons.
Identifiers: Polarons, Electron phonon interactions, Liquid helium, Fermi surfaces, Liouville equation.

A very brief discussion is given of research in the following fields: Analytical methods in nonrelativistic field theory; point transforms in the quantum many body problem; singular perturbation theory in kinetic theory; light scattering from gases; variational principles in kinetic theory; solution of the Liouville equation; moment method in kinetic theory. (Author)

AD-750 809 Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
SYNCHROTRON RADIATION AS EVIDENCE AGAINST THE RITZ EMISSION THEORY,
R. G. Newburgh. 10 Mar 72, 4p Rept no. AFCRL-72-0541
Revision of report dated 31 Jan 72.
Availability: Pub. in American Jnl. of Physics, v40 p1173-1175 Aug 72.

Descriptors: (*Relativity theory, Light), Synchrotrons, Transformations (Mathematics), Velocity.
Identifiers: *Synchrotron radiation, *Special relativity, Lorentz transformations.

The angular distribution of the radiation emitted by relativistic electrons in a synchrotron has been calculated theoretically by Schwinger on the basis of the special theory of relativity and confirmed experimentally. It is shown that these results contradict those predicted by the Ritz emission theory. Therefore, synchrotron radiation may be regarded as a further indirect confirmation of Einstein's second postulate concerning the velocity of light. (Author)

N72-29621 PC$3.00/MF$0.95
Techtran Corp., Glen Burnie, Md.
THEOREM OF OPTIMAL DIVISION OF POINT OF VARIABLE MASS.
J. M. Moskalenko. Aug 72, 9p NASA-TT-F-14343, PR-85
Contract NASW-2037
Tran- Transl. Into English of Teorema Ob Optimalnom Delenii Tochki Peremen. Massy Rept. Pr-85 Acad. Sci. USSR, Moscow, 1971 11 P

Descriptors: *Flight mechanics, *Gravitational fields, *Mass distribution, *Variable mass systems, Optimization, Theorem proving.

For abstract, see STAR 10 20.

N72-29690 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
RELATIVISTIC TIME CORRECTIONS FOR APOLLO 12 AND APOLLO 13.
J. E. Lavery. Aug 72, 14p NASA-TN-D-6681, E-1049

Descriptors: *Apollo 12 flight, *Apollo 13 flight, *Clock paradox, *Relativistic effects, Atomic clocks, Doppler effect, Red shift, Time.

For abstract, see STAR 10 20.

N72-29844 PC$11.75/MF$0.95
California Inst. of Tech., Pasadena.
THE THEORETICAL TOOLS OF EXPERIMENTAL GRAVITATION.
C. M. Will. Jun 72, 194p NASA-CR-127806
Contracts NGR-05-002-256, NSF GP-27304
Subm- Submitted for Publication

Descriptors: *Gravitation theory, *Relativistic theory, Equations of motion, Field theory (physics), Formalism, Parameterization, Solar system.

For abstract, see STAR 10 20.

20K. Solid Mechanics

AD-750 406 Not available NTIS
Shock and Vibration Information Center (Defense) Washington D C
THE SHOCK AND VIBRATION DIGEST. VOLUME 4, NUMBER 10, OCTOBER 1972.
Oct 72, 103p
See also Volume 4, Number 9, AD-749 057.
Availability: Paper copy available from The Shock and Vibration Information Center, Naval Research Laboratory, Code 8404, Washington, D. C. 20390. Annual subscription $25.00.

Descriptors: (*Shock (Mechanics), Symposia), (*Vibration, Naval research), Wounds + injuries, Brain, Stresses, Damping, Abstracts, Mathematical models, Seismic waves, Acoustic properties, Structural parts, Experimental data, Mechanical properties, Systems engineering.
Identifiers: Finite element analysis, Computerized simulation.

Contents:
Analysis and design;
Environments;
Phenomenology;
Experimentation;
Components;
Systems.

AD-750 412 Reprint
California Univ San Diego La Jolla
NOTE ON THE CENTER OF TWIST,
W. T. Tsai. 16 Jun 71, 2p
Contract N00014-69-A-0200-6027
Revision of report dated 16 Mar 71.
Availability: Pub. in the Jnl. of Applied Mechanics, p297-298 Mar 72.

Descriptors: (*Torsion, Theory), Inertia, Integral equations.

AD-750 418 Reprint
Stanford Univ Calif Dept of Aeronautics and Astronautics
BUCKLING OF AXIALLY COMPRESSED CIRCULAR CYLINDRICAL SHELLS AT STRESSES SMALLER THAN THE CLASSICAL CRITICAL VALUE,
N. J. Hoff, and L. W. Rehfield. 2 Dec 64, 7p
AFOSR-TR-72-1956
Contract AF 49 (638)-1276
Revision of report dated 18 May 64. Presented the Applied Mechanics/Fluids Engineering Conference, Washington, D. C., of the American Society of Mechanical Engineers, 7-9 Jun 65. Paper No. 65-APM-21, p533-537.
Availability: Pub. in Jnl. of Applied Mechanics, v32 p533-537 Sep 65.

Descriptors: (*Structural shells, *Buckling (Mechanics)), Loading (Mechanics), Load distribution, Stresses, Compressive properties, Numerical analysis.
Identifiers: *Cylindrical shells, Spherical shells, Axial compression.

Closed-form solutions are given of the linear Donnell equations defining the buckling of thin-walled circular cylindrical shells subjected to uniform axial compression. In addition to the classical simple support conditions requiring the vanishing of the radial displacement, the axial bending-moment resultant, the axial additional normal-stress resultant, and the circumferential displacement, three other, equally justifiable, simple support conditions are defined and studied in the case of the semi-infinite shell. Two of them yield buckling stresses amounting to about one half the classical critical stress. (Author)

AD-750 437 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE SOLUTION OF TWO-DIMENSIONAL PERIODIC AND BIPERIODIC PROBLEMS OF THE THEORY OF STEADY-STATE OSCILLATIONS OF ELASTIC AND VISCOELASTIC BODIES,
V. T. Golovchan, and A. N. Guz. 11 Aug 72, 12p
Rept no. FTD-MT-24-315-72
Edited machine trans. of Mono. Volny v Neuprugikh Sredakh (Waves in Inelastic Media) Kishinev, 1970 p57-63, by Robert Allen Potts.

Descriptors: (*Viscoelasticity, Boundary value problems), (*Elasticity, Boundary value problems), Partial differential equations, Vibration, Oscillation, Fourier analysis, Series, USSR.
Identifiers: Translations, Fourier series.

A description is given of a method for solving the main boundary value problems in the theory for the steady oscillations of plane elastic and viscoelastic bodies perforated by rows of equal diameter circular holes. The method is based on

series expansion, and the problems are reduced to infinite systems of algebraic equations yielding a unique bounded solution. (Author)

AD-750 442 Reprint
Northwestern Univ Evanston Ill Dept of Civil Engineering
DYNAMICALLY INDUCED FRACTURE,
R. J. Nuismer, Jr., and J. D. Achenbach. 25 Jun 71, 21p
Contract N00014-67-A-0356-0014
Prepared in cooperation with Utah Univ., Salt Lake City. Dept. of Mechanical Engineering.
Availability: Pub. in Jnl. of the Mechanics and Physics of Solids, v20 p203-222 1972.

Descriptors: (*Fracture (Mechanics), Mathematical analysis), (*Cracks, Stresses), Loading (Mechanics), Integral transforms, Creep.

Expressions are presented for the stresses generated in the vicinity of a crack tip when a plane transient tension-stress wave, which is incident under an arbitrary angle, is diffracted by the crack. The effect of ductility effects on the combined Mode I and Mode II fractures is examined by assuming that yielding is restricted to a thin strip in the plane of the crack. Within this zone of yielding the normal stress in a certain defined direction is set equal to a yield stress of the material. It is shown that for a step-stress wave the leading edge of the zone of yielding initially moves at a constant speed, which is computed. The time for rupture at the trailing edge of the zone of yielding is also determined. (Author)

AD-750 458 Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
PULSE PROPAGATION IN A NONLINEAR VISCOELASTIC ROD OF FINITE LENGTH,
Michael P. Mortell, and Brain R. Seymour. 28 Jul 71, 18p Rept no. NYU-ONR-H-34
Contract N00014-67-A-0467-0006
Revision of report dated 2 Feb 71.
Availability: Pub. in the SIAM Jnl. on Applied Mathematics, v22 n2 p209-224 Mar 72.

Descriptors: (*Structural parts, Mechanical waves), Nonlinear systems, Rods, Impact shock, Loading (Mechanics), Viscoelasticity, Deformation, Initial value problems, Difference equations.
Identifiers: Themis project.

The problem of impact on a nonlinear viscoelastic rod of finite length is considered. It is shown that, in the high frequency or geometrical acoustics limit, the disturbance in the rod may be represented as the superposition of two modulated simple wave traveling in opposite directions which do not interact in the body of the material. Based on this result the impact and initial boundary value problems are reduced to finding the solution of a nonlinear difference equation, which is solved exactly. The authors examine the competing effects of amplitude dispersion, which may produce shocks, and dissipation and give conditions under which each dominates. The corresponding results for an inhomogeneous road are also given. (Author)

AD-750 546 PC$3.00/MF$0.95
Massachusetts Inst of Tech Cambridge Aeroelastic and Structures Research Lab
LATERAL BENDING-TORSION VIBRATIONS OF A THIN BEAM UNDER PARAMETRIC EXCITATION,
John Dugundji, and Vivekananda Mukhopadhyay. Jun 72, 41p Rept no. ASRL-TR-159-4 AFOSR-TR-72-2007
Contract F44620-69-C-0091

Descriptors: (*Cantilever beams, *Vibration), Bending, Torsion, Resonance, Equations of motion.
Identifiers: Vibration tests, Mathieu functions.

A thin plate-like cantilever beam, well below static lateral buckling under gravity, is subjected to vertical harmonic excitation of its base. The governing equations reduce to systems of two Mathieu equations coupled mainly by symmetric, off-diagonal parametric excitation terms. For such cases, the primary instability regions are shown to occur near forcing frequencies (omega sub F) = (omega sub i) + (omega sub j), with each mode oscillating at its own natural frequency, omega sub i. Experiments performed on an actual beam confirm this behavior. Since the beam had nonlinear damping, the instability regions settled down to steady limit cycles whose frequencies and amplitudes were well predicted by theory. The simultaneous excitation of two modes, each oscillating at its own natural frequency, may be of considerable interest in vibration testing of actual structures. (Author)

AD-750 574 PC$3.00/MF$0.95
Watervliet Arsenal N Y
A MICROSTRUCTURE THEORY FOR THE BUCKLING AND VIBRATION OF A LAMINATED BEAM.
Technical rept.,
Gary L. Anderson. Jul 72, 69p Rept no. WVT-7234

Descriptors: (*Beams (Structural), Buckling (Mechanics)), (*Vibration, Beams (Structural)), Laminates, Microstructure, Theory, Equations of motion, Partial differential equations, Resonant frequency.

A theory is derived for the flexural deformation of laminated beams subjected to initial stresses. Each layer is treated as a Timoshenko beam and 'smoothed' expressions for the kinetic and strain energies and the work done by external forces are derived. A system of three coupled partial differential equations, including the effect of bending, extension, rotation, and initial axial stress are obtained from Hamilton's principle. Specific buckling and free vibration problems are solved exactly for hinged-hinged and clamped-clamped beams. (Author)

AD-750 575 PC$3.00/MF$0.95
Watervliet Arsenal N Y
THE METHODS OF RITZ, GALERKIN, AND COMPLEMENTARY ENERGY APPLIED TO SOME NONCONSERVATIVE PROBLEMS OF ELASTIC STABILITY.
Technical rept.,
Gary L. Anderson. Jul 72, 44p Rept no. WVT-7236

Descriptors: (*Loading (Mechanics), Approximation (Mathematics)), (*Cantilever beams, *Vibration), Buckling (Mechanics), Calculus of variations, Boundary value problems, Partial differential equations, Integration, Elasticity.
Identifiers: Beck problem, Ritz-Galerkin method, Complementary energy methods.

The well-known problem of Beck and two problems due to Hauger which arise in the theory of nonconservative elastic stability are reconsidered. Approximate values of the respective critical loads are computed by means of the methods of Ritz, Galerkin, and complementary energy in conjunction with a formal variational expression and the adjoint variational principle. For these examples, it was found that the speed of convergence of the procedures is somewhat better in the case of the method of complementary energy, but the Galerkin procedure is probably the simplest to apply. The numerical calculations demonstrate that the previously published values of the critical load intensity for Hauger's two problems are about 5% and 28% too high. (Author)

AD-750 594 PC$3.00/MF$0.95
Cold Regions Research and Engineering Lab Hanover N H
ANALYSIS OF THE BUCKLING OF AN ELASTIC PLATE FLOATING ON WATER AND STRESSED UNIFORMLY ALONG THE PERIPHERY OF AN INTERNAL HOLE.
Final rept. 1 Mar-30 Jun 72,
Shunsuke Takagi. Sep 72, 32p AROD-I-466:1-E

Descriptors: (*Buckling (Mechanics), Panels (Structural)), Stresses, Floating bodies, Differential equations, Asymptotic series, Orifices.
Identifiers: Plates (Structural members).

The problem can be reduced to an eigenvalue problem of a fourth order ordinary differential equation in a semi-infinite region. The series that satisfied the boundary condition at infinity is asymptotic, which cannot satisfy the boundary condition at a finite point and fails to yield the eigenvalues. Theoretically this difficulty can be overcome, as explained in this report, by converting the divergent asymptotic series to a convergent factorial series. (Author)

AD-750 638 PC$3.00/MF$0.95
Virginia Polytechnic Inst and State Univ Blacksburg Coll of Engineering
A THEOREM FOR OPTIMUM IDEALIZATIONS IN FINITE-ELEMENT ANALYSIS,
Richard M. Barker, and Wayne E. Carroll. 7 Sep 72, 37p Rept no. VPI-E-72-19
Contract DAAF07-69-C-0444
Prepared in cooperation with Florida Technological Univ., Orlando.

Descriptors: (*Continuum mechanics, Numerical analysis), Elasticity, Strain (Mechanics), Integrals, Matrix algebra, Integration, Theorems, Loading (Mechanics), Potential energy.
Identifiers: *Finite element analysis.

A development is presented which serves to characterize the nature of an optimum finite-element idealization. It is shown that a true minimum of the system potential energy must consider the idealization geometry as a primary parameter. As a consequence, two optimization equations result, one the usual equilibrium equation and the other a residual equation involving gradients of the stiffness matrix and load vector resulting from changes in the idealization. A technique for determining the optimum solution is described and is applied to a one-dimensional example of a flexural problem. Practical recommendations are given based on an examination of the residuals associated with the optimization process. (Author)

AD-750 908 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
AMPLITUDE ANALYSIS OF RANDOM PROCESSES WITH CYCLICAL STRESSES,
B. Z. Slobin. 7 Aug 72, 17p Rept no. FTD-MT-24-289-72
Edited trans. of Mashinovedenie (USSR) n1 p59-64 1971, by Robert D. Hill.

Descriptors: (*Fatigue (Mechanics), Stresses), Vibration, Stochastic processes, USSR.
Identifiers: Translations.

The principle of amplitude analysis (breakdown into elementary cycles) is formulated for the realizations of a wideband random process in connection with the problem of the mechanical fatigue of structures acted upon by random forces. An approximate solution is obtained for the amplitude distribution of the elementary cycles of a normal steady state wide band process, the solution being valid for large amplitude values. (Author)

AD-750 942 PC$3.00/MF$0.95
Polytechnic Inst of Brooklyn N Y Dept of Aerospace Engineering and Applied Mechanics
ANALYSIS OF A PERFORATED CIRCULAR CYLINDRICAL SHELL SUBJECTED TO AXIAL

TENSION, EDGE MOMENT OR TRANSVERSE SHEAR.
Richard Mondello, and Martin A. Goldberg. Sep 72, 92p Rept no. PIBAL-72-29 AFOSR-TR-72-2062
Contract F44620-69-C-0072

Descriptors: (*Structural shells, Stresses), Loading (Mechanics), Shear stresses, Tensile properties, Bending, Deformation, Least squares method.
Identifiers: Cylindrical shells, Circular shells, *Openings.

The method of least square point matching is employed in the analysis of a shallow, circular cylindrical shell with a cutout. The cylinder may be infinite or semi-infinite, and the cutout is either circular or elliptic. For the ellipse the major axis can be oriented either parallel or perpendicular to the generator. In particular, two examples are presented: an infinite cylinder subjected to uniform axial tension, and a semi-infinite cylinder loaded at its edge by either a uniform bending moment or a transverse shear force. In both cases the minor axis of the elliptic cutout is parallel to the generator. The boundary of the perforation is free of tractions and supports. Numerical results are presented and show the effects of variations in: the hole size to cylinder curvature ratio; the eccentricity of the cutout; and for semi-infinite cylinders, the distance from the cutout to the edge. (Author)

AD-750 953 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
STUDY OF THE STABILITY OF THIN-WALLED CYLINDRICAL SHELLS WITH A FILLER UNDER AXIAL COMPRESSION,
V. V. Vlasov, and A. N. Guz. 18 Aug 72, 17p Rept no. FTD-MT-24-322-72
Edited machine trans. of Mekhanika Tverdogo Tela (USSR) n5 p93-99 1970, by Robert D. Hill.

Descriptors: (*Structural shells, Stability), Cylindrical bodies, Compressive properties, Structural properties, Filling, USSR.
Identifiers: Translations, Structural analysis, *Cylindrical shells.

The stability of cylindrical shells with a filler under axial compression is examined, and for the filler three-dimensional linearized equations at small subcritical deformations are used. With the aid of a computer the influence of the geometric parameters and rigidity of the shell and filler on the magnitude of critical stress is investigated. a comparison with results obtained on the basis of simplified calculations is given. in the study of stability it is considered that the filler absorbs part of the compressive load and is rigidly fastened to the envelope. Used for the shell are equations of the stability of thin-walled cylindrical shells, and for the filler three-dimensional linearized equations of stability are used. (Author)

AD-750 991 PC$7.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
ALL-UNION CONFERENCE ON THE THEORY OF PLATES AND SHELLS (SELECTED ARTICLES).
23 Jun 72, 96p Rept no. FTD-HT-23-101-72
Edited trans. of Vsesoyuznaya Konferentsiya po Teorii Plastin i Obolochek. Trudy (USSR) v1 p60-65, 101-106, 137-141, 177-185, 191-203, 271-277, 353-357, 367-375 1960, by K. L. Doin.

Descriptors: (*Structural parts, Bending), (*Structural shells, Loading (Mechanics)), Cylindrical bodies, Boundary value problems, Stresses, Conical bodies, Stability, Mathematical models, USSR.
Identifiers: Translations, *Plates (Structural members), *Cylindrical shells.

Contents:
Bending of a thin rectangular cantilever plate by an arbitrarily distributed transverse load;
Large bends of a rectangular plate under the action of uniform normal pressure with uneven heating, hydrodynamic forces appearing at a dynamic loss of stability in cylindrical shells immersed in a fluid;
Solutions in special functions to problems of nonsymmetric deformation of mildly sloping spherical and conical shells;
One method of solving systems of nonlinear finite-difference equations describing the bending of plates;
Application of the melthod of series approximations to the study of large deflections of a circular plate and a very mildly sloping spherical segment;
Stability of cylindrical shells immersed in a fluid during short dynamic loads;
Dynamic stability of a circular cylindrical shell under the action of a wave impact load;
Toward a theory of plates of average thickness.

AD-750 999 Not available NTIS
Stanford Univ Calif Dept of Applied Mechanics
DYNAMIC RESPONSE OF STRUCTURES.
Final rept.,
George Herrmann, and Nicholas Perrone. 16 Oct 72, 370p AFOSR-TR-72-2068
Proceedings of Symposium Dynamic Response of Structures, held at Stanford, Calif. June 28-29, 1971.
Availability: Paper copy available from Pergamon Press Inc. Maxwell House, Fairview Park, Elmsford, N. Y. 10523 $17.50. Library of Congress Catalog Card No. 75-171021.

Descriptors: (*Mechanical properties, *Symposia), (*Structures, Structural properties), Structural shells, Loading (Mechanics), Vibration, Rendezvous spacecraft, Flutter, Tolerances (Physiology), Safety harness, Airframes, Aviation accidents, Stresses.
Identifiers: Aircraft crashworthiness, Dynamic response.

In order to create a forum for an interchange of ideas and for communication to some new methodologies and results, it was deemed desirable to bring together workers in several diverse areas of dynamic response of structures for a two-day symposium. The principal aim of this meeting was to highlight some recent developments, without attempts at providing any degree of completeness of coverage. The symposium was held on June 28 and 29, 1971, at Stanford University and the technical presentations were grouped in four sessions under the titles Structural Elements, Structural Systems, Aircraft Crashworthiness, and Materials and Solids. (Author)

N72-28698 PC$3.00/MF$0.95
College of William and Mary, Williamsburg, Va.
STABILITY OF CERTAIN PERIODIC SOLUTIONS OF A FORCED SYSTEM WITH HYSTERESIS.
J. H. Drew. 1972, 9p NASA-CR-127462
Contract NGL-47-006-055

Descriptors: *Forced vibration, *Hysteresis, *Stability, Nonlinear systems, Periodic variations.

For abstract, see STAR 10 19.

N72-28898 PC$7.50/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Brunswick (West Germany). Inst. Fuer Flugzeugbau.
THE APPLICATION OF THE RAYLEIGH-RITZ METHOD WITH MESHWISE INTERPOLATION TO CALCULATING THE BUCKLING LOADS 20K, 80ODWICH SHELLS.
B. Geier. 1972, 106p DLR-FB-72-05
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Rayleigh-ritz method, *Sandwich structures, *Shells (structural forms), *Structural analysis, Buckling, Numerical analysis, Shallow shell equations.

For abstract, see STAR 10 19.

N72-28899 PC$3.00/MF$0.95
Lockheed-georgia Co., Marietta.
RESIDUAL STRENGTH AND CRACK PROPAGATION TESTS ON C-130 AIRPLANE CENTER WINGS WITH SERVICE-IMPOSED FATIGUE DAMAGE.
H. L. Snider, F. L. Reeder, and W. Dirkin. Jul 72, 67p NASA-CR-2075, ER-11178
Contract NAS1-9485

Descriptors: *Crack propagation, *Fatigue tests, *Wings, Static tests, Structural design.

For abstract, see STAR 10 19.

N72-28901 PC$30.75/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
VIBRATION MANUAL.
C. Green. 1 Dec 71, 592p NASA-TM-X-64669

Descriptors: *Vibration damping, *Vibration measurement, *Vibration tests, Industrial management, Systems analysis, Technology utilization.

For abstract, see STAR 10 19.

N72-28904 PC$3.00/MF$0.95
National Research Council of Canada, Ottawa (Ontario).
EXPERIMENTAL STUDY OF THE ULTIMATE STRENGTH OF COMPOSITE BEAMS SUBJECTED TO ALTERNATE LOADING OF POSITIVE AND NEGATIVE BENDING.
H. Makino, M. Hirosawa, S. Tabota, T. Takada, and J. Maki. 1972, 6p NRC-TT-1557
Tran- Transl. Into English From Proc. of the Japan Soc. of Architectural Eng., V. 42, No. 10, 1967 P 478

Descriptors: *Beams (supports), *Stress analysis, *Structural analysis, Bending moments, Elastic deformation, Numerical analysis, Structural strain.

For abstract, see STAR 10 19.

N72-28906 PC$3.50/MF$0.95
Lehigh Univ., Bethlehem, Pa. Inst. of Fracture and Solid Mechanics.
AN INTEGRAL EQUATION APPROACH TO THE STRIP PROBLEM.
G. D. Gupta. Jun 72, 27p NASA-CR-127685, NASA-TR-72-5
Contracts NGR-39-007-011, NSF GK-11977

Descriptors: *Integral equations, *Stresses, *Transformations (mathematics), Composite materials, Laminates, Numerical analysis.

For abstract, see STAR 10 19.

N72-28907 PC$9.00/MF$0.95
Applied Physics Lab., Johns Hopkins Univ., Silver Spring, Md.
NASTRAN USER EXPERIENCE WITH FOUR EXAMPLE PROBLEMS.
R. M. Rivello. Apr 72, 139p NASA-CR-127681, TG-1196
Contract N00017-72-C-4401
Subm- Supported in Part By Nasa

Descriptors: *Computer programs, *Structural analysis, Beams (supports), Digital computers, Input/output routines, Matrices (mathematics).

For abstract, see STAR 10 19.

N72-29490 PC$4.00/MF$0.95
North Carolina State Univ., Raleigh. Dept. of Mechanical and Aerospace Engineering.
AN EXPERIMENTAL STUDY OF THE CRYOENTRAINMENT PUMP AND THE BEHAVIOR OF NUDE IONIZATION GAUGE AT LOW TEMPERATURE.
Final Summary Report
J. A. Daggerhart. 10 May 72, 36p
NASA-CR-112128
Contract NGR-34-002-106

Descriptors: *Cryogenic equipment, *Cryopumping, *Vacuum apparatus, Condensing, Low temperature physics, Vacuum chambers.

For abstract, see STAR 10 20.

N72-29890 PC$15.00/MF$0.95
Oklahoma Univ., Norman. School of Aerospace, Mechanical and Nuclear Engineering.
VIBRATION AND DAMPING OF LAMINATED, COMPOSITE-MATERIAL PLATES INCLUDING THICKNESS-SHEAR EFFECTS.
Final Report, Part 2
C. W. Bert, and C. C. Siu. Mar 72, 259p
NASA-CR-112140
Contract NGR-37-003-055

Descriptors: *Composite materials, *Laminates, *Shear stress, *Stress analysis, *Vibration effects, Deformation, Dynamic structural analysis, Numerical analysis.

For abstract, see STAR 10 20.

N72-29892 PC$3.75/MF$0.95
Denver Research Inst., Colo. Industrial Economics Div.
A CASE STUDY IN TECHNOLOGY UTILIZATION FRACTURE MECHANICS.
May 72, 35p NASA-CR-127779
Contract NSR-06-004-063

Descriptors: *Case histories, *Fracture mechanics, *Technology utilization, Service life, Systems engineering, Technology transfer.

For abstract, see STAR 10 20.

N72-29895 PC$9.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
ADVANCED APPROACHES TO FATIGUE EVALUATION.
1972, 675p NASA-SP-309
Conf- Proc. of the 6th Icaf Symp., Miami, 13-14 May 1971

Descriptors: *Aircraft structures, *Conferences, *Fatigue tests, Aircraft design, Aircraft reliability, Failure analysis, Loads (forces).

For abstract, see STAR 10 20.

N72-29918 PC$4.50/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
VISCEL A GENERAL PURPOSE COMPUTER PROGRAM FOR ANALYSIS OF LINEAR VISCOELASTIC STRUCTURES, VOLUME 2.
K. K. Gupta, and F. A. Akyuz. 15 Jul 72, 50p
NASA-CR-127750, JPL-TM-33-466-VOL-2
Contract NAS7-100

Descriptors: *Computer programming, *Linear systems, *Viscoelasticity, Equilibrium methods, Finite element method, Optimization.

For abstract, see STAR 10 20.

N72-29920 PC$6.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
THE NASTRAN THEORETICAL MANUAL (LEVEL 15).
R. H. Macneal. Apr 72, 601p NASA-SP-221 (01)

Descriptors: *Dynamic structural analysis, *Nasa programs, *Structural design criteria, *Structural engineering, Computer programs, Error analysis, Numerical analysis.

For abstract, see STAR 10 20.

N72-29921 PC$21.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
THE NASTRAN USERS MANUAL (LEVEL 15).
C. W. Mccormick. Jun 72, 1540p NASA-SP-222 (01)

Descriptors: *Computer programs, *Dynamic structural analysis, *Nasa programs, Input/output routines, Manuals, Numerical analysis.

For abstract, see STAR 10 20.

N72-29922 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A PRELIMINARY INVESTIGATION OF PROJECTILE SHAPE EFFECTS IN HYPERVELOCITY IMPACT OF A DOUBLE-SHEET STRUCTURE.
R. H. Morrison. Aug 72, 13p NASA-TN-D-6944, A-4394

Descriptors: *Hypervelocity projectiles, *Impact tests, *Terminal ballistics, Cylindrical bodies, Fineness ratio, Spheres.

For abstract, see STAR 10 20.

N72-30505 PC$5.25/MF$0.95
Institut Fuer Festkoerpermechanik, Freiburg (West Germany).
SHOCK INDUCED WAVE PROPAGATION IN A LINEAR VISCOELASTIC BAR . LUFTSTOSS - INDUZIERTE WELLENAUSBREITUNG IN EINEM LINEAR VISKOELASTISCHEN STAB.
U. Soltesz. Nov 71, 62p WB-3/71
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Shock wave propagation, *Solithanes, *Viscoelastic cylinders, Bars, High speed cameras, Isochromatics, Shock tubes, Stress propagation.

For abstract, see STAR 10 21.

N72-30532 PC$4.75/MF$0.95
Cincinnati Univ., Ohio. Dept. of Engineering Analysis.
AN ANALYSIS OF GENERAL CHAIN SYSTEMS.
C. E. Passerello, and R. L. Huston. 1972, 55p
NASA-CR-127924
Contract NGL-36-004-014

Descriptors: *Dynamic characteristics, *Rigid structures, Computer programming, Finite element method, Matrices (mathematics).

For abstract, see STAR 10 21.

N72-30921 PC$10.00/MF$0.95
Southwest Research Inst., San Antonio, Tex.
DEFORMATION MECHANICS OF DEEP SURFACE FLAW CRACKS.
Final Report
P. H. Francis, A. Nagy, and R. E. Beissner. Jul 72, 158p NASA-CR-128514
Contract NAS9-12012

Descriptors: *Crack propagation, *Deformation, *Finite element method, Aluminum, Holography, Interferometry, Plastic properties, Steels.

For abstract, see STAR 10 21.

N72-30922 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
FATIGUE CRACK GROWTH FROM A CIRCULAR HOLE WITH AND WITHOUT HIGH PRIOR LOADING.
J. H. Crews, Jr., and N. H. White. Sep 72, 34p
NASA-TN-D-6899, L-8305

Descriptors: *Aluminum alloys, *Crack propagation, *Metal sheets, *Stress analysis, Cyclic loads, Fatigue (materials), Stress cycles.

For abstract, see STAR 10 21.

N72-30926 PC$5.00/MF$0.95
Max-planck-institut Fuer Stromungsforschung, Gottingen (West Germany).
DERIVATION OF THE CLASSICAL THEORETICAL ELASTICITY PLATE EQUATION BY SYSTEMATIC THICKNESS PARAMETER EXPANSION . HERLEITUNG DER PLATTENGLEICHUNG DER KLASSISCHEN ELASTIZITAETSTHEORIE DURCH SYSTEMATISCHE ENTWICKLUNG NACH EINEM DICKENPARAMETER.
Thesis - Goettingen Univ.
K. Brod. 1972, 60p REPT-2/1972

Descriptors: *Calculus of variations, *Differential equations, *Elastic bending, *Elastic plates, Approximation, Stress tensors, Thickness.

For abstract, see STAR 10 21.

N72-30928 PC$4.25/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Brunswick (West Germany). Inst. Fuer Flugzeugbau.
POSTBUCKLING CALCULATION FOR AN INFINITELY LONG ISOTROPIC CIRCULAR CYLINDER . NACHBEULRECHNUNG FUER EINEN UNENDLICH LANGEN ISOTROPEN KREISZYLINDER.
M. Esslinger. Jun 72, 43p DLR-FB-72-37
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Axial loads, *Buckling, *Circular cylinders, High speed cameras, Isotropic media, Karman-bodewadt flow, Mathematical models, Thin walled shells.

For abstract, see STAR 10 21.

PB-212 638 PC$3.00/MF$0.95
University of Southern California, Los Angeles. Dept. of Civil Engineering.
LIMIT PRESSURES OF CIRCULAR CYLINDRICAL SHELLS SUBJECT TO RIGID DISPLACEMENT CONSTRAINTS.
Final rept.,
Hwa-shan Ho. Aug 72, 44p USCCE-004
Grant NSF-GK-27828

Descriptors: (*Cylindrical shells, *Loads (Forces)), Yield strength, Combined stress, Collapse, Plastic limit, Stresses, Critical pressure.

The exact limit pressure is examined for a circular cylindrical shell rigidly supported at both ends. The Tresca yield criterion is assumed, with shear deformation neglected. Exact velocity and stress field equations are derived. It is found that the limit pressure is reached only asymptotically. In other words, plastic rupture occurs only if a 'small' central ring force is applied, if the velocity field is to remain finite. As expected, result shows an inverse correlation between the shell length and the yield pressure. Calculations are obtained by introducing a small perturbing outward central ring force. (Author)

PB-212 649 PC$3.00/MF$0.95
Acta Polytechnica Scandinavica, Stockholm (Sweden).
ON THE STATE OF STRESS AND DISPLACEMENT OF CERTAIN SHELLS OF TRANSLATION.
Civil engineering and building construction series, Martti M. Kaila. 1972, 87p APS-CI-71
Paper copy also available from: The Finnish Academy of Technical Sciences, Lonnrotinkatu 37, 00180 Helsinki 18 (Finland). Fmk 8.00.

Descriptors: (*Shells (Structural forms), Structural analysis), Elastic shells, Stress analysis, Displacement, Differential equations, Membranes, Bending, Sweden.

The goal of the investigation is to produce relevant information about the state of stress and displacement of structures consisting of alternatingly elliptic and hyperbolic paraboloidal shells with a rectangular planform. The individual shells are assumed to be joined together smoothly, without intermediate supporting members. The number of shells, contained in the structures, is fixed at three. All shells are assumed to be shallow, thin, homogeneous, and to obey Hooke's law. The question, whether the structures under consideration are able to carry transversal load, is studied by deriving formal solutions both according to the membrane theory and according to the bending theory, and by examining the character and the meaningfulness of the solutions. (Author)

20L. Solid-State Physics

AD-750 316 PC$3.00/MF$0.95
Picatinny Arsenal Dover N J
STABILITY OF AMMONIUM NITRATE AS INFERRED FROM STRUCTURAL AND LATTICE-DYNAMICAL STUDIES,
Chang S. Cjoi, Zafar Iqbal, Henry J. Prask, and Samuel F. Trevino. 1972, 15p

Descriptors: (*Nitrates, *Crystal structure), Neutron diffraction analysis, Water vapor, Phonons, Vibration, Chemical bonds.
Identifiers: Ammonium nitrates, Sodium nitrates, Lattice vibrations.

The paper describes how neutron diffraction has been used to determine the complete structure of the room-temperature phase of NH4NO3 for the first time. This information alone has provided considerable insight into the role of water vapor in the physical instability of this substance. In addition, neutron spectroscopy has been applied to NaNO3 to obtain the first, reasonably complete description of the dynamics of molecules in any metal-nitrate salt and to discern the relation between dynamics and instability. In order to accomplish the latter work of significant advance in the theoretical interpretation of complex spectra was required and achieved. (Author)

AD-750 397 PC$3.00/MF$0.95
Texas Univ Austin
AMORPHOUS SEMICONDUCTORS.
Semiannual technical rept. 1 Apr-30 Sep 72,
James C. Thompson. 30 Sep 72, 9p
Grant DA-ARO-D-31-124-72-G75, ARPA Order-1562

Descriptors: (*Semiconductors, Compressive properties), Specific heat, Transition temperature, Glass, Germanium compounds, Arsenides, Tellurides.
Identifiers: *Amorphous semiconductors, Glass transition temperature.

Direct measurements of the isothermal compressibility have been made to complement the adiabatic compressibility determined acoustically. The heat capacity ratio gamma is identically equal to (C sup p)/ (C sub v) is near unity. Acoustic determinations of the glass transition are being made. (Author)

AD-750 414 PC$3.00/MF$0.95
Maryland Univ College Park Dept of Electrical Engineering
THE STUDY OF THE INTERACTION OF INTENSE PICOSECOND LIGHT PULSE WITH MATERIALS (1) MEASUREMENT OF PICOSECOND PULSE WIDTH USING TWO--PHOTON CONDUCTIVITY IN GAAS. (2) THREE PHOTON CONDUCTIVITY IN CDS.
Quarterly technical rept. 22 Mar-22 Jun 72,
Chi H. Lee, and S. Jayaraman. 1 Aug 72, 19p Rept no. TR-10
Grant DA-ARO-D-31-124-72-G82, ARPA Order-675
See also report dated 1 May 72, AD-743 517.

Descriptors: (*Gallium arsenides, Photoconductivity), (*Cadmium sulfides, Photoconductivity), (*Lasers, Pumping (Optical)), Light pulses, Photoelectric effect, Transients, Band theory of solids.
Identifiers: Two photon absorption, Three photon absorption, Neodymium glass lasers.

Two-photon conductivity effect in GaAs has been used to map the second order intensity correlation function of the picosecond laser pulse for the first time. Reproducible data were obtained. The contrast ratio is about 1.8. This is limited by the thickness of the sample. In principle this method can be extended to use very thin sample to obtained subpicosecond time resolution. Three photon induced photoconductivity effect has been observed in CdS polycrystalline sample with a mode-locked Nd:glass laser. The three photo absorption coefficient was measured to be 0.043 cc/G (W sq). (Author)

AD-750 432 Reprint
Massachusetts Inst of Tech Cambridge Francis Bitter National Magnet Lab
EFFECTS OF THE SPIN-FLOP TRANSITION ON THE TWO-MAGNON ABSORPTION IN MANGANESE FLUORIDE (MNF2),
T. Bernstein, A. Misetich, and Benjamin Lax. 17 Dec 71, 9p AFOSR-TR-72-1986
Contract F44620-67-C-0047
Sponsored in part by National Science Foundation, Washington, D. C.
Availability: Pub. in Physical Review B, v6 n3 p979-986, 1 Aug 72.

Descriptors: (*Manganese compounds, Magnetic resonance), Fluorides, Transition temperature, Antiferromagnetism, Infrared spectroscopy, Absorption spectrum, Cryogenics.
Identifiers: *Magnons, *Magnesium fluorides, *Two magnon absorption spectra.

Manganese fluoride (MnF2), as well as many other magnetic insulators, orders antiferromagnetically below its Neel temperature. The elementary spin excitations in such an ordered state, known as spin waves or magnons, have been directly observed in these systems.

AD-750 444 Reprint
IBM Watson Research Center Yorktown Heights N Y
RAMAN SCATTERING IN AMORPHOUS SILICON, GERMANIUM AND III-V SEMICONDUCTORS,
J. E. Smith, M. H. Brodsky, B. L. Crowder, and M. I. Nathan. 1972, 7p AFOSR-TR-72-2019
Contract F44620-71-C-0039

Descriptors: (*Semiconductors, *Raman spectroscopy), Silicon, Germanium, Ion bombardment, Light transmission, Scattering, Diamonds, Graphite.
Identifiers: *Amorphous semiconductors, Raman scattering.

A phenomenological explanation of Raman scattering in amorphous Si, Ge and III-V semiconductors is given, using Si as an example. Several applications of Raman scattering to the study of amorphous materials are discussed. (Author)

AD-750 445 Reprint
California Univ San Diego La Jolla Dept of Physics
HEAT CAPACITY OF SUPERCONDUCTING TERNARY MOLYBDENUM SULFIDES,
R. Viswanathan, and A. C. Lawson. 25 May 72, 4p AFOSR-TR-72-1989
Contracts AT (04-3)-34, F44620-72-C-0017

Descriptors: (*Superconductors, Specific heat), Molybdenum compounds, Silver compounds, Lead compounds, Tin compounds, Sulfides.
Identifiers: *Molybdenum sulfides, Ternary systems.

The heat capacities of AgMo4S5, PbMo6S7, and SnMo5S6 are reported. These ternary molybdenum sulfides have been found to be bulk superconductors with very large values of electronic heat capacity coefficients and very low values of Debye temperatures. (Author)

AD-750 446 Reprint
Massachusetts Inst of Tech Cambridge Francis Bitter National Magnet Lab
POLARON ZEEMAN EFFECT IN CDTE,
Daniel R. Cohn, David M. Larsen, and Benjamin Lax. 15 Nov 71, 10p AFOSR-TR-72-1987
Contract F44620-67-C-0047
Availability: Pub. in Physical Review B, v6 n4 p1367-1375, 15 Aug 72.

Descriptors: (*Semiconductors, Band theory of solids), Zeeman effect, Electron transitions, Phonons, Infrared spectroscopy, Cadmium compounds, Tellurides.
Identifiers: *Cadmium tellurides, Electron phonon interactions, *Polarons, Far infrared radiation.

Fourier-transform spectroscopy was used to observe the far-infrared absorption resulting from the 1s to 2p shallow-donor-impurity transitions in cadmium tellurde. At zero magnetic field the absorption was found to occur at eighty-seven point three plus and minus 0 point 3/centimeter. This value compares very well with the prediction of the simple hydrogenic model for shallow-donor-impurity states. The Zeeman splitting of the (1s to 2p) transition was studied in magnetic fields as high as one hundred sixty-five kilogauss. (Author)

AD-750 447 Reprint
Stanford Univ Calif
STRUCTURE AND BONDING IN AMORPHOUS GE (X)TE (1-X) ALLOYS,
F. Betts, A. Bienenstock, and C. W. Bates, Jr. 1972, 9p AROD-9240:3-P
Contract DAHC04-70-C-0044
Prepared in cooperation with Varian Associates, Inc., Palo Alto, Calif. Sponsored in part by Advanced Research Projects Agency.
Availability: Pub. in Jnl. of Non-Crystalline Solids, v8-10 p364-368 Jun 72.

Descriptors: (*Semiconductors, Molecular structure), Crystal structure, Chemical bonds, Germanium compounds, Tellurides.
Identifiers: *Amorphous semiconductors, *Germanium tellurides.

X-ray radial distribution studies of the system Ge (x)Te (1-x) have been interpreted in terms of a random covalent structural model. To further elucidate the structure and bonding type, X-ray absorption edge and X-ray photoemission studies were undertaken. (Author)

AD-750 452 Reprint
Maryland Univ College Park Engineering Materials Group
DISLOCATION ANALYSIS OF CRACK LAMELLAE.
Technical rept.,
Marion J. Marcinkowski, and Ronald W. Armstrong. 16 Nov 71, 10p Rept no. TR-6
Contract N00014-67-A-0239-0011
Availability: Pub. in Jnl. of Applied Physics, v43 n6 p2548-2554 Jun 72.

Descriptors: (*Cracks, *Dislocations), Microstructure, Fracture (Mechanics), Continuum mechanics, Stresses, Numerical analysis.
Identifiers: *Lamellar structure, Griffith crack.

A detailed numerical analysis has been carried out with respect to the equilibrium configuration of both shear and tensile crack lamellae under varying applied stresses. The cracks were assumed to consist of circular concentric glide and prismatic dislocation loops, respectively. Among other things, it was found that for a given fracture stress, circular cracks are required to be larger in size than straight cracks and that the circular tensile cracks are larger in size and greater in energy than circular shear cracks. In addition, it is shown that the Griffith criterion for crack growth simply corresponds to specifying the lowest energy for a given number and arrangement of dislocation loops. (Author)

AD-750 461 Reprint
Colorado Univ Boulder Dept of Mechanical Engineering
PHOTOPLASTIC BEHAVIOR OF CDTE,
Lennart Carlsson, and C. N. Ahlquist. 24 Nov 71, 9p AFOSR-TR-72-1990
Grant AF-AFOSR-2172-72
Prepared in cooperation with Chalmers Univ. of Technology, Goteborg (Sweden). Dept. of Solid State Physics.
Availability: Pub. in Jnl. of Applied Physics, v43 n6 p2529-2536 Jun 72.

Descriptors: (*Semiconductors, Photoelasticity), Plasticity, Dislocations, Photoelectric effect, Stresses, Strain (Mechanics), Compressive properties, Single crystals, Crystal growth, Cadmium compounds, Tellurides.
Identifiers: *Cadmium tellurides.

Single crystals of CdTe have been grown by the Bridgman technique with boric oxide as liquid encapsulation. The nonstoichiometry of these p-type crystals was changed by heat treating in Cd vapor of different partial pressures. Mechanical measurements performed in compression on the n- and p-type crystals in darkness and during illumination showed that high-resistivity crystals had the lowest yield stress; at the same time, only a very small influence of illumination on the yield stress could be detected. The yield stress of low-resistivity samples, however, could be increased as much as 70% by illumination with light corresponding to the band-gap energy. Strain-rate cycling tests have been performed in compression on as-grown crystals. The Johnson-Gilman velocity-stress relationship was used to evaluate the dislocation velocity effective stress exponent and the long-range internal stresses built up during deformation in light and darkness, respectively. (Author)

AD-750 462 Reprint
Stanford Univ Calif Microwave Lab
EXCHANGE INTERACTIONS AND FLUCTUATIONS IN CERIUM HEXABORIDE,
K. N. Lee, and Brian Bell. 24 Jan 72, 11p AFOSR-TR-72-1988
Grant AF-AFOSR-1510-68
Availability: Pub. in Physical Review B, v6 n3 p1032-1040, 1 Aug 72.

Descriptors: (*Cerium compounds, Specific heat), Borides, Antiferromagnetism, Phase studies, Magnetic properties, Molecular energy levels, Crystal lattices, Wave functions, Cryogenics.
Identifiers: Ising model, *Cerium borides, Ligand fields, Electron spin, Quantum chemistry, Exchange interactions.

The authors report measurements of the low-temperature specific heat of CeB6 and discuss their significance in the light of earlier studies of this compound. The large specific heat above the antiferromagnetic ordering at 2.31K is interpreted with the aid of a decorated Ising model. This model permits one to combine exchange and crystal field interactions in a simplified, but exact, calculation of the thermodynamic properties of a magnetic system including the effects of fluctuations. The analysis gives independent support to the proposal by Nickerson and White that the exchange in the crystal field excited state is substantially stronger than the ground-state exchange in CeB6. The authors also comment on the possibility of extending such an analysis to other magnetic rare-earth hexaborides. (Author)

AD-750 481 PC$3.00/MF$0.95
Polytechnic Inst of Brooklyn N Y Dept of Physics
THEORETICAL STUDIES OF SOLID SURFACES.
Final rept. 1 Feb 69-31 Jul 72,
D. S. Boudreaux, and J. B. Krieger. 30 Sep 72, 11p Rept no. PIBPH-72-009 AFOSR-TR-72-1731
Grant AF-AFOSR-1709-69

Descriptors: (*Surface properties, Scientific research), Electron diffraction analysis, Crystal lattices, Band theory of solids, Aluminum, Ground state, Helium.
Identifiers: Low energy electron diffraction.

Presented is the final report for three and one-half years of theoretical study on the physics of solid surfaces. Progress was made in the interpretation of electron diffraction experiments, and in the determination of the electronic charge distribution in the vicinity of a solid surface and its consequences. (Author)

AD-750 506 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
STUDY OF THE NATURE OF A P-N HETEROGENEOUS JUNCTION IN A CDSE MONOCRYSTAL OBTAINED BY THE GAS TRANSPORT METHOD,
G. A. Mamedova, and M. Ya. Bakirov. 2 Aug 72, 10p Rept no. FTD-HT-23-262-72
Edited trans. of Akademiya Nauk Azerbaidzhanskoi SSR, i Mathematicheskikh Nauk, n6 p6-8 1969, by R. J. Zeccola.

Descriptors: (*Cadmium selenides, Electrical properties), Semiconductors, Photosensitivity, Electrical conductance, Interfaces, USSR.
Identifiers: Translations, *Semiconductor junctions.

CdSe is one of the effective materials for the creation of photoelectric converters. The paper is concerned with a study of the nature of the p-n-junction in a CdSe monocrystal. The monocrystals used in this project were grown by the gas transport method. They were black in color, lobe-shaped with an area of 1 to 4 times to the (-2) power/sq cm and a thickness of 0.01-0.03 cm, possessed electron conductivity, a specific resistance at room temperature of 130-150 ohms/cm, an electron concentration of n (e) about 10 to the 16th power cc, and a mobility of eta (e) about 300 sq cm/v-s.

AD-750 608 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
MAGNETIC ORDERING IN LITHIUM-TRANSITION METAL OXIDES WITH ORDERED ROCKSALT STRUCTURES.
Research and development technical rept.,
A. Tauber. Aug 72, 149p Rept no. ECOM-4015
Doctoral thesis.

Descriptors: (*Lithium compounds, Magnetic properties), Chromium compounds, Nickel compounds, Manganese compounds, Iron oxides, Crystal structure, Solid solutions, Theses, Antiferromagnetism, Oxides.
Identifiers: *Lithium oxides, Chromium oxides, Nickel oxides, Manganese oxides, Magnetic susceptibility, Magnons, *Magnetic ordering, Molecular field theory.

A better understanding of the nature and mechanisms of superexchange is sought by studying magnetic ordering in compounds isotypic with alpha-NaFeO2. Exchange, superexchange, and Weiss molecular field theory are reviewed. The Heisenberg-Dirac-Van Vleck Hamiltonian is derived by an intuitive method. The historic development of superexchange in terms of quantitative theory and qualitative rules is considered. The Weiss molecular field theory is used to compute the exchange parameters. Its advantages, limitations and predictions are stated and the several expressions employed are developed. The crystal chemistry and some physical properties of ordered rocksalts isotypic with alpha-NaFeO2 are analyzed. (Author)

AD-750 696 PC$3.00/MF$0.95
Defence Research Information Centre Orpington (England)
SURFACE SPACE-CHARGE EFFECT ON CERTAIN PHOTOELECTRIC PROPERTIES OF GALLIUM ARSENIDE (P-TYPE),
O. Yu. Borkovskaya. Oct 72, 7p Rept nos. DRIC-Trans-2913, DRIC-BR-30284
Trans. of Ukrayinskyi Fizychnyi Zhurnal (USSR) v17 n5 p835-838 May 72, by P. N. Hiles.

Descriptors: (*Gallium arsenides, Photoconductivity), Electrical properties, Carriers (Semiconductors), Thermal properties, Photosensitivity, USSR.
Identifiers: Translations.

The report presents an examination of p-type GaAs. The author examined spectral and temperature characteristics of natural photoconductivity and condensation photo e.m.f. and also the effect on them of an external transverse electrical field and constant brightness.

AD-750 712 PC$3.00/MF$0.95
Notre Dame Univ Ind Dept of Metallurgical Engineering and Materials Science
DISLOCATION DAMPING IN SINGLE CRYSTALS OF CONTROLLED SUBSTRUCTURE.
Final rept. 1 Sep 67-31 Aug 72,
Nicholas F. Fiore. 1 Oct 72, 8p AROD-7119:8-MC
Grant DA-ARO (D)-31-124-G936

Descriptors: (*Copper, *Single crystals), (*Dislocations, Damping), (*Internal friction, Measurement), Crystal growth, Gamma rays, Radiation damage, Crystal lattice defects, Ultrasonic radiation, Attenuation.
Identifiers: Ultrasonic attenuation, Ultrasonic tests, Point defects.

Techniques have been developed for reproducibly growing Cu single crystals of controlled dislocation cell size and controlled random dislocation density. The ultrasonic pulse-echo attenuation of the crystals of various substructure has been measured from 2 to 100 MHz. The resonance bar damping of the crystals has been measured from 2 to 250 kHz. The damping and attenuation have been found to strong functions of substructure, and the 'vibrating membrane' modification of the Granato-Lucke theory of dislocation damping has been proposed to explain the relationship. (Author)

AD-750 726 PC$3.00/MF$0.95
Case Western Reserve Univ Cleveland Ohio
FERMI SURFACE OF DILUTE ALLOYS.
Final rept. 16 Mar 65-30 Jun 72,
W. L. Gordon. 27 Oct 72, 34p AROD-4987:3-P
Contract DA-31-124-ARO (D)-342

Descriptors: (*Zinc alloys, Band theory of solids), (*Cadmium alloys, Band theory of solids), (*Aluminum alloys, Band theory of solids), Solid solutions, Chemical precipitation, Crystal growth, Magnetic properties.
Identifiers: *Fermi surfaces, De Haas-Van Alphen effect.

Fermi surface changes in dilute alloys of aluminum, of cadmium and of zinc were explored by de Haas-van Alphen methods. In aluminum, nontransition metal solutes of greater and lesser valence produced changes consistent with the rigid band model and no anistropy of electron scattering was observed on the small portions of the Fermi surface studied here. In the isoelectronic alloys Zn Cd and Zn Hg as well as Cd Mg, the influence of axial ratio changes have been determined on Fermi surface parameters and steady susceptibility. Finally, the effect of precipitation on the scattering temperature and on magnetic breakdown was investigated in supersaturated Zn Cd alloys. (Author)

AD-750 877 Reprint
Hawaii Inst of Geophysics Honolulu
TEMPERATURE DEPENDENCE OF THE ELASTIC CONSTANTS OF SINGLE-CRYSTAL RUTILE BETWEEN 4 AND 583 K,
M. H. Manghnani, E. S. Fisher, and W. S. Brower, Jr. 11 Feb 72, 13p Rept no. HIG-Contrib-427
Contract N00014-70-A-0016-0001
Prepared in cooperation with Argonne National Lab., Ill. and National Bureau of Standards, Washington, D. C. Revision of report dated 4 Nov 71.
Availability: Pub. in Jnl. of Physics and Chemistry of Solids, v33 p2149-2159 1972.

Descriptors: (*Rutile, Elasticity), Titanium compounds, Dioxides, Thermal expansion, Single crystals, Cryogenics, Ultrasonic radiation.
Identifiers: *Titanium dioxide, Ultrasonic tests.

The purpose of this paper is to report measuremeats of all the elastic constants of single-crystal rutile in the temperature range of 298-583K, and of some of the temperature range of 4-298K, and to evaluate these results in the light of a recent study on the pressure dependence of these elastic constants.

AD-750 882 Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
WAVE PROPAGATION IN A RANDOM LATTICE. I,
Pao-Liu Chow, and Joseph B. Keller. 20 Jan 72, 10p Rept no. NYU-ONR-H45
Contract N00014-67-A-0467-0006, Grant NSF-GP-27209
Revision of report dated 12 Jan 72.
Availability: Pub. in Jnl. of Mathematical Physics, v13 n9 p1405-1411 Sep 72.

Descriptors: (*Crystal lattices, Wave transmission), Impurities, Dispersion relations, Vibration, Green's function.
Identifiers: Lattice vibrations.

The small amplitude periodic classical motion of a lattice of particles about their equilibrium positions in a lattice is considered. The effect of random masses and random spring constants upon the coherent or mean motion is treaded by using an equation for the coherent motion derived previously by Keller and others. From this equation the dispersion equation for coherent wave motion is determined. It is solved for the case in which the spring constants are not random but the masses are random. Explicit results are obtained in the one-dimensional case for both uncorrelated and exponentially correlated mass defects. They show an alteration of frequency or of wavelength and of phase velocity, as well as an attenuation due to scattering by the defects. In addition new highly attenuated modes are found. These results are uses in Part 2 in which various reflection and Green's function problems are treated. (Author)

AD-750 904 Reprint
Columbia Radiation Lab New York
PHOTON ECHOES IN CAWO4:ND (3+),
S. Chandra, N. Takeuchi, and S. R. Hartmann. 30 Jun 72, 2p
Contract DAAB07-69-C-0383, Grant NSF-GH-34407
Availability: Pub. in Physics Letters, v41A n1 p91-92, 28 Aug 72.

Descriptors: (*Neodymium, *Electron transitions), Excitation, Crystal lattice defects, Doping, Tungstates, Atomic energy levels.
Identifiers: *Photon echoes, Calcium tungstates, Ligand fields.

The authors report the generation and detection of photon echoes in CaWO4:Nd (3+). They also describe photon echo behavior as a function of an applied magnetic field and of temperature. (Author)

AD-750 937 PC$3.00/MF$0.95
Dayton Univ Ohio Research Inst
A PRELIMINARY STUDY OF THE ELECTRICAL PROPERTIES OF SEMICONDUCTING CDF2 WITH CE (3+) AND GD (3+) CODOPANTS.
Technical rept. 1 May 70-1 Dec 71,
Michael A. Bafico, and Perry P. Yaney. Aug 72, 99p Rept no. UDRI-TR-72-37 AFML-TR-72-140
Contract F33615-71-C-1121

Descriptors: (*Semiconductors, Electrical properties), (*Cadmium compounds, Electrical properties), Fluorides, Doping, Cerium, Gadolinium, Dielectric properties, Resistance (Electrical), Hall effect, Carriers (Semiconductors).
Identifiers: *Cadmium fluorides.

Electrical measurements were made on insulating and semiconducting Gd3+:CdF2 (Ce3+) samples. The gadolinium concentration was held at .02 mole % while the cerium concentrations were .006, .02 and .06 mole %. Samples were heated at 520C in a Cd vapor for 30 minutes and quenched to room temperature. Various electrode metals were studied, including Ag, In, Hg-In alloy and Au. The techniques of applying these electrodes included vacuum deposition, thermal soldering and ultrasonic soldering. Complex dielectric constants were measured over the frequency range of 50 Hz to 20 MHz. The large real dielectric constants found were attributed to a depletion layer formed within the sample. A voltage dependent capacitance was observed. Bulk resistivities were obtained using a pulse technique. (Author)

AD-750 977 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
INVESTIGATING THE POSSIBILITIES OF INCREASING THE STABILITY OF THE PHOTOELECTRIC CHARACTERISTICS OF IR-RADIATED SILICON N-P JUNCTIONS,
G. M. Grigorev, L. B. Krenin, and A. P. Landsman. 11 Aug 72, 15p Rept no. FTD-MT-24-15-72
Edited machine trans. of mono. Radiatsionnaya Fizika Nemetallicheskikh Kristallov (Radiation Physics of Nonmetallic Crystals) Minsk, 1970 p167-173, by Henry Peck.

Descriptors: (*Silicon, Photosensitivity), (*Semiconducting devices, Radiation damage), Proton bombardment, Annealing, Lithium, USSR.
Identifiers: Translations, Semiconductor junctions.

A change in the photoelectric characteristics of n-p junctions caused by hard irradiation is ordinarily undesirable and can be reduced by various methods. This work presents certain results of experiments on annealing irradiated silicon n-p junctions made of p-type material and on the effect of the proton bombardment of n-p junctions based on n-type silicon with a lithium admixture. (Author)

AD-750 980 Reprint
Princeton Univ N J Dept of Physics
RESONANT INTERACTIONS BETWEEN LOCALIZED LO PHONONS AND CONTINUUM STATES OF DONORS IN CDS AND CDSE,
J. P. Hopfield, and C. H. Henry. 25 Jan 72, 8p AFOSR-TR-72-2042
Contract F44620-71-C-0108
Prepared in cooperation with Bell Telephone Labs., Murray Hill, N. J.
Availability: Pub. in Jnl. Physical Review B, v6 n6, p2233-2238, 15 Sep 72.

Descriptors: (*Cadmium selenides, Phonons), (*Cadmium sulfides, Phonons), Band theory of solids, Excitons, Anisotropy, Line spectrum.

The first longitudinal-optical- (LO-) phonon replica of the I (2) line (decay of an exciton bound to a neutral donor) in CdS and CdSe is structured and broadened. The replica is roughly Lorentzian in shape, shifted to lower energy than the nominal LO-phonon energy and has a sharp notch near the center of the line. These features are shown to arise from coupling between LO phonons and the donor electron. The line is lifetime broadened by ionization of the coupling of different LO-phonon modes. The notch is an interference effect resulting from the coupling of the localized mode existing immediately after the electron and hole recombine with less-damped modes, located more distant from the donor. (Author)

AD-750 995 Reprint
Belfer Graduate School of Science New York
EXACTLY SOLUBLE MODEL OF INTERACTING ELECTRONS,
D. C. Mattis, and S. B. Nam. 9 Mar 72, 6p AFOSR-TR-72-2071
Grant AF-AFOSR-2153-72
Availability: Pub. in Jnl. of Mathematical Physics, v13 n8 p1185-1189 Aug 72.

Descriptors: (*Antiferromagnetism, Quantum mechanics), (*Fermions, Hamiltonian), Electrons, Free energy, Interactions, Excitation, Matrix algebra, Ground state.
Identifiers: Ising model, Electron spin, Elementary excitations, Hubbard model.

The authors diagonalize a many-fermion Hamiltonian consisting of terms quadratic as well as quartic in the field operators. A dual spectrum of eigenstates is an interesting result. They also derive a formula for obtaining the free energy at finite temperature. (Author)

AD-751 007 Reprint
State Univ of New York Stony Brook Dept of Electrical Sciences
PLANAR MAGNETORESISTIVITY AND PLANAR HALL EFFECT MEASUREMENTS IN NICKEL SINGLE-CRYSTAL THIN FILMS,
T. T. Chen, and V. A. Marsocci. 28 Jun 71, 16p AFOSR-TR-72-2076
Grant AF-AFOSR-1116-66
Availability: Pub. in Physica, v59 p490-509 1972.

Descriptors: (*Nickel, Magnetic properties), Metallic crystals, Ferromagnetic materials, Single crystals, Hall effect, Anisotropy.
Identifiers: Magnetic films, Thin films, Magnetoresistivity, Magnetic anisotropy.

The planar magnetoresistivity anisotropy and the planar Hall effect in nickel single-crystal films have been explained successfully by using a phenomenological equation in a tensor form. The anisotropy constants defined for this equation are directly related to the planar measurements and can be used as paramerers for making relative comparisons in the study of the magnetoresistivity anisotropy effects. It is demonstrated that these effects in ferromagnetic crystals can be studied by measurements on single-crystal films. (Author)

AD-751 009 Reprint
Massachusetts Inst of Tech Cambridge Dept of Physics

THEORY OF RESONANT, FAR-INFRARED GENERATION IN INDIUM ANTIMONIDE,
Terrence L. Brown, and P. A. Wolff. 19 Jun 72, 5p
AFOSR-TR-72-2075
Grant AF-AFOSR-2010-71
Availability: Pub. in Physical Review Letters, v29 n6 p362-364, 7 Aug 72.

Descriptors: (*Irasers, Indium antimonides), (*Indium antimonides, Pumping (Optical)), Gas lasers, Tuning devices, Infrared radiation, Electron spin resonance.
Identifiers: Far infrared radiation, Semiconductor lasers.

Spin-flip light scattering has been studied in a variety of semiconductors. The spin-flip process may be viewed as a form of nonlinear spin resonance, in which the spins are driven (via the Raman coupling) at the difference frequency between two light waves. This viewpoint leads to a prediction of large, resonant, optical mixing coefficient for electron spins in InSb. The theory has been confirmed by far infrared generation experiments performed at Bell Telephone laboratories. At resonance, the mixing coefficient is very large, and might serve as the basis for a useful far infrared source. (Author)

AD-751 012 Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
NUCLEAR-MAGNETIC-RESONANCE STUDY OF CO (2+) IN CDS,
David C. Look, and Donald R. Locker. 27 Jan 72, 9p Rept no. ARL-72-0137
Availability: Pub. in Physical Review B, v6 n3 p713-718, 1 Aug 72.

Descriptors: (*Cadmium sulfides, Nuclear magnetic resonance), (*Nuclear magnetic resonance, *Cobalt), Phonons, Crystal lattice defects, Nuclear spins, Relaxation time, Doping, Single crystals, Cryogenics.
Identifiers: *Spin lattice relaxation.

Nuclear spin-lattice relaxation times T (1), have been measured over a temperature range T = (1.1-300)K and frequency range nu=2-15 MHz in a single crystal of CdS doped with 13-ppm cobalt. Minima in T (1) vs T are observed, and absolute values of the effective electron relaxation time, tau (e), may be calculated at the temperatures of the minima. (Author)

N72-28695 PC$11.50/MF$0.95
Toulouse Univ. (France).
STUDY OF THE POSSIBILITY OF UTILIZING THE CHARACTERISTIC VARIATIONS OF MAGNETIC MATERIALS AS TEMPERATURE FUNCTIONS . ETUDE ET POSSIBILITES DUTILISATION DES VARIATIONS DES CARACTERISTIQUES DES MATERIAUX MAGNETIQUES EN FONCTION DE LA TEMPERATURE.
Ph.D. Thesis
R. Ferrier. 28 Jun 72, 188p

Descriptors: *Ferromagnetic materials, *Magnetic materials, *Magnetic variations, *Temperature, Mathematical models, Measuring instruments, Test equipment.

For abstract, see STAR 10 19.

N72-28726 PC$5.75/MF$0.95
Technische Hochschule Munchen (West Germany). Fakultaet Fuer Bauwesen.
STUDY OF VAN DER WAALS FORCES BETWEEN MACROSCOPIC BODIES AT DISTANCES FROM 100 A TO 1600 A . STUDIUM DER VAN DER WAALS KRAEFTE ZWISCHEN MAKROSKOPISCHEN KOERPERN BEI ABSTAENDEN VON 100 A BIS 1600 A.
Ph.D. Thesis
H. Splittgerber. Nov 71, 74p

Descriptors: *Glass, *Mechanical measurement, *Quartz, *Van der waal forces, Bending moments, Dipole moments, Strain gages, Thin plates.

For abstract, see STAR 10 19.

N72-28763 PC$3.00/MF$0.95
Stanford Univ., Calif. Solid-state Electronics Lab.
FUNDAMENTAL STUDIES OF THE METALLURGICAL, ELECTRICAL, AND OPTICAL PROPERTIES OF GALLIUM PHOSPHIDE AND GALLIUM PHOSPHIDE ALLOYS.
Technical Summary Report, 1 Feb. 1969 - 31 Jan. 1972
Apr 72, 15p NASA-CR-127458, SU-SEL-72-012
Contract NGL-05-020-043

Descriptors: *Abstracts, *Electrical properties, *Gallium alloys, *Metallurgy, *Optical properties, Electric equipment, Gallium arsenides, Gallium phosphides, High temperature research, Sulfur, Work functions.

For abstract, see STAR 10 19.

N72-28764 PC$10.50/MF$0.95
Saarland Univ., Saarbrucken (West Germany).
STUDIES OF THE EFFECT OF NOBLE METAL SINGLE CRYSTAL DIMENSIONS ON OPTICAL MATERIAL CONSTANTS IN THE REGION OF SPHERICAL PLASMA RESONANCE . UNTERSUCHUNGEN ZUM EINFLUSS DER GROESSE VON EDELMETALL-MIKROKRISTALLITEN AUF DIE OPTISCHEN MATERIALKONSTANTEN IM BEREICH DER KUGEL-PLASMA-RESONANZ.
Ph.D. Thesis
U. Kreibig. 1971, 167p

Descriptors: *Band structure of solids, *Crystal lattices, *Gold, *Optical resonance, *Particle size distribution, *Silver, Absorption spectra, Dielectric polarization, Electron oscillations, Mie scattering, Plasmons.

For abstract, see STAR 10 19.

N72-28765 PC$4.25/MF$0.95
Saarland Univ., Saarbrucken (West Germany).
SUPERCONDUCTIVITY AND BAND FERROMAGNETISM IN THE TWO BAND MODEL . SUPRALEITUNG UND BANDFERROMAGNETISMUS IM ZWEIBANDMODELL.
Ph.D. Thesis
D. Rainer. 1970, 142p

Descriptors: *Band structure of solids, *Ferromagnetism, *Metals, *Superconductivity, Crystal lattices, Holes (electron deficiencies), Particle motion, Spin exchange.

For abstract, see STAR 10 19.

N72-28768 PC$4.50/MF$0.95
Technische Hochschule Munchen (West Germany). Fakultaet Fuer Allgemeine Wissenschaften.
DIRECT MECHANICAL MEASUREMENT OF PIVOT-STRENGTH IN TYPE 2 SUPERCONDUCTORS . DIREKTE MECHANISCHE MESSUNG VON PINNING-KRAEFTEN IN TYP 2-SUPRALEITERN.
Ph.D. Thesis
G. Eggendorfer. 19 Nov 71, 50p

Descriptors: *Crystal defects, *Crystal dislocations, *Niobium, *Superconductivity, Electrical properties, Low temperature physics, Mechanical measurement, Torque, Transport properties.

For abstract, see STAR 10 19.

N72-28769 PC$5.00/MF$0.95
Technische Hochschule Hannover (West Germany). Facultat Fuer Mathematik Und Naturwissenschaften.
POLAR AND LATTICE DYNAMIC CHARACTERISITCS OF FERROELECTRIC POTASSIUM IODATE CRYSTALS . POLARE UND GITTERDYNAMISCHE EIGENSCHAFTEN VON FERROELEKTRISCHEM KJO3.
Ph.D. Thesis
E. Salje. 19 Jul 71, 57p

Descriptors: *Crystal lattices, *Dynamic characteristics, *Polarization characteristics, *Potassium iodides, *Transport properties, Electro-optical effect, Ferroelectricity, Lattice vibrations, Piezoelectricity.

For abstract, see STAR 10 19.

N72-28770 PC$5.75/MF$0.95
Electrotechnical Lab., Tokyo (Japan).
FLUCTUATIONS IN THE RESISTIVE TRANSITION IN SUPERCONDUCTING ALUMINUM FILMS.
K. Kajimura. Nov 71, 75p RR-720

Descriptors: *Aluminum, *Electrical resistivity, *Superconductors, *Thin films, *Transition temperature, Electric fields, Magnetic fields, Purity, Thermodynamic properties, Transport properties.

For abstract, see STAR 10 19.

N72-28896 PC$6.50/MF$0.95
Boeing Co., Seattle, Wash. Aerospace Group.
FUNDAMENTAL INVESTIGATION OF STRESS CORROSION CRACKING.
Final Report, 1 Jul. 1971 - 30 Apr. 1972
T. R. Beck, M. J. Blackburn, and W. H. Smyrl. 30 Apr 72, 88p NASA-CR-127726, D180-15006-1
Contract NASW-2245

Descriptors: *Crack propagation, *Halides, *Pitting, *Stress corrosion, *Titanium alloys, Bromides, Electrochemical corrosion, Halides, Solutions, Viscosity.

For abstract, see STAR 10 19.

N72-28897 PC$3.75/MF$0.95
Aeronautical Research Labs., Melbourne (Australia).
SIMPLE THEORETICAL STUDIES OF FATIGUE CRACK PROPAGATION USING A FRACTURE MECHANICS APPROACH.
B. C. Hoskin. Dec 71, 34p ARL/SM-NOTE-372

Descriptors: *Crack propagation, *Fracture mechanics, *Stress analysis, Applications of mathematics, Fatigue (materials), Structural analysis.

For abstract, see STAR 10 19.

N72-30740 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DETERMINATION OF WORK FUNCTIONS NEAR MELTING POINTS OF REFRACTORY METALS BY USING A DIRECT-CURRENT ARC.
W. A. Gordon, and G. B. Chapman, II. Aug 72, 20p NASA-TN-D-6888, E-6896

Descriptors: *Electric arcs, *Melting points, *Refractory metals, *Work functions, Argon, Direct current, Thermionic emission.

For abstract, see STAR 10 21.

N72-30741 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

QUANTUM LIMIT STUDIES IN SINGLE CRYSTAL AND PYROLYTIC GRAPHITE.
J. A. Woollam, D. J. Sellmyer, R. O. Dillon, and I. L. Spain. 20 Aug 72, 10p NASA-TM-X-68125
Contracts NSF GP-21312, AT (40-1)-3782
Conf- Presented At 13th Intern. Conf. on Low Temp. Phys., Boulder, Colo., 20-26 Aug. 1972

Descriptors: *Graphite, *Quantum theory, *Single crystals, Brillouin zones, Energy bands.

For abstract, see STAR 10 21.

N72-30742 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
MAGNETIC FIELD EFFECTS ON SUPERCONDUCTIVITY IN ALKALI METAL INTERCALATES OF MOS2.
J. A. Woollam, D. J. Flood, D. E. Wagoner, R. Somoano, and A. Rembaum. 18 Aug 72, 10p NASA-TM-X-68109

Descriptors: *Magnetic fields, *Molybdenum disulfides, *Potassium, *Sodium, *Superconductivity, Alkali metals, Magnetic effects, Transition temperature.

For abstract, see STAR 10 21.

N72-30748 PC$6.00/MF$0.95
Office National Detudes Et de Recherches Aerospatiales, Paris (France).
DEFORMATION MECHANISMS OF TANTALUM CARBIDE UP TO 2200 C . MECANISMES DE DEFORMATION DU CARBURE DE TANTALE JUSQUA 2200 C.
Ph.D. Thesis - Paris Univ.
J. E. Martin. 1972, 79p ONERA-P-143
LANG- IN FRENCH ENGLISH SUMMARY

Descriptors: *Crystal defects, *High temperature tests, *Mechanical properties, *Tantalum carbides, Bending, Crystal lattices, Diffraction patterns, Ionic crystals, Phase diagrams, Plastic deformation, Refractory materials.

For abstract, see STAR 10 21.

N72-30749 PC$3.00/MF$0.95
Rome Univ. (Italy). Inst. of Physics.
INFLUENCZ OF DIMENSIONALITY ON BOSE CONDENSATION AND MACROSCOPIC COHERENCE IN SUPERCONDUCTORS.
G. Lucano, S. Pace, and G. L. Romani. 23 Mar 72, 7p NOTA-INTERNA-365
Subm- Sponsored in Part By Cnr

Descriptors: *Bose geometry, *Dimensions, *Flux quantization, *Superconductors, Condensation, Critical point, Electrical resistivity, Elementary excitations, Landau-ginzburg equations, Temperature effects.

For abstract, see STAR 10 21.

N72-30750 PC$3.75/MF$0.95
Office National Detudes Et de Recherches Aerospatiales, Toulouse (France).
DEGRADATION OF MAGNESIUM FLUORIDE INFLUENCE OF THE CONDITIONS OF IRRADIATION.
M. Romero. Jun 72, 31p ONERA-NT/02/30

Descriptors: *Crystal defects, *Ionic crystals, *Magnesium fluorides, *Radiation effects, Color centers, Degradation, Electron energy, Electron irradiation, Energy spectra, Far ultraviolet radiation.

For abstract, see STAR 10 21.

20M. Thermodynamics

AD-750 760 Not available NTIS
Colorado State Univ Fort Collins
THE THERMAL-BURST MODEL OF THERMOHALINE NATURAL CONVECTION,
W. R. Lindberg, and R. D. Haberstroh. 1972, 29p
Contract N00014-67-A-0299-0009
Presented at the National Heat Transfer Conference (13th), AIChE-ASME, Denver, Colo. 6-9 Aug 72. AIChE Preprint-32. Prepared in cooperation with Woods Hole Oceanographic Inst., Mass. Availability: Paper copy available from American Institute of Chemical Engineers, 345 East 47th St., New York, N. Y. 10017. PC$1.00.

Descriptors: (*Convection (Heat transfer), Sea water), Boundary layer, Partial differential equations, Turbulence, Temperature.
Identifiers: *Thermohaline circulation.

Predictions are made of the flux parameters of heat and solute in the turbulent natural convection which can occur between horizontal, permeable plates when heat and solute are supplied from below and removed above in steady state. As thermohaline convection has received little attention in the engineering literature, introductory and descriptive aspects of the subject are considered. The driving parameters, the relevant property groups, and the flux parameters are presented, and a convenient selection of dimensionless groups is made. An expansion of the boundary-layer stability model originally devised by Louis Howard for thermal natural convection is made to give the thermal-burst model of thermohaline-boundary-layer stability. An appropriately defined density Rayleigh number is viewed as controlling the stability of the wall conduction layers. (Author)

N72-28922 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
POLYNOMIAL APPROXIMATIONS OF THERMODYNAMIC PROPERTIES OF ARBITRARY GAS MIXTURES OVER WIDE PRESSURE AND DENSITY RANGES.
D. O. Allison. Aug 72, 34p NASA-TN-D-6862, L-8297

Descriptors: *Approximation, *Gas mixtures, *Planetary atmospheres, *Thermodynamics, Atmospheric density, Curve fitting, Polynomials, Pressure measurements.

For abstract, see STAR 10 19.

N72-28926 PC$4.25/MF$0.95
New York Univ., N.Y. Aerospace Lab.
HEAT TRANSFER DISTRIBUTION ON A DISCONTINUOUSLY CONVECTIVE COOLED SURFACE.
R. Piva, and R. Poch. 1972, 44p NASA-CR-112047
Contract NGR-33-016-131

Descriptors: *Convection, *Cooling, *Heat transfer, Free flow, Hypersonic speed.

For abstract, see STAR 10 19.

N72-29923 PC$3.00/MF$0.95
Airesearch Mfg. Co., Los Angeles, Calif.
THERMAL AND STRUCTURAL TESTS OF A HYDROGEN COOLED PANEL.
C. E. Richard, J. D. Duncan, E. W. Gellersen, and C. Demogenes. Aug 72, 56p NASA-CR-2105, REPT-70-7040
Contract NAS1-5002

Descriptors: *Hydrogen, *Inconel (trademark), *Metal plates, *Thermodynamic properties, Cooling, Materials tests, Mechanical properties, Structural analysis.

For abstract, see STAR 10 20.

N72-29957 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
THE EFFECT OF ELECTRIC FIELDS ON THE HEAT TRANSFER IN GASES.
H. Senftleben, and E. Bultmann. Aug 72, 14p
NASA-TT-F-14397
Contract NASW-2035
Tran- Transl. Into English From Z. Physik (Berlin), V. 136, 1953 P 389-401

Descriptors: *Electric fields, *Electrostriction, *Gas flow, *Heat transfer, Convective flow, Numerical analysis, Thermodynamic properties.

For abstract, see STAR 10 20.

N72-29958 PC$10.75/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Stuttgart (West Germany). Abteilung Staustrahl- Und Kombinationsan-Triebe.
COMPUTATION OF THE OPERATION OF HOT WATER STORAGE VESSELS . ZUR BERECHNUNG DER ARBEITSWEISE VON HEISSWASSERSPEICHERN.
Ph. D. Thesis - Tech. Univ. Brunswick
H. Hardegen. Mar 72, 174p DLR-FB-72-24
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Differential equations, *Steam, *Storage tanks, *Water, Computer programming, Content, Extraction, Heat transfer, High temperature fluids, Mass transfer, Pressure vessels.

For abstract, see STAR 10 20.

N72-30773 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
WALL TEMPERATURE DISTRIBUTION CALCULATION FOR A ROCKET NOZZLE CONTOUR.
S. Omori, K. W. Gross, and A. Krebsbach. Jul 72, 115p NASA-TN-D-6825

Descriptors: *Computer programs, *Rocket nozzles, *Temperature distribution, *Wall temperature, Heat transfer, Regenerative cooling, Turbulent boundary layer.

For abstract, see STAR 10 21.

N72-30952 PC$3.00/MF$0.95
Lockheed Missiles and Space Co., Huntsville, Ala.
A STUDY FOR DEVELOPMENT OF AEROTHERMODYNAMIC TEST MODEL MATERIALS AND FABRICATION TECHNIQUE.
W. G. Dean, and L. E. Connor. Jun 72, 104p
NASA-CR-2065, HREC-9983-1
Contract NAS1-9983

Descriptors: *Aerodynamic heating, *Heat transfer, *Materials tests, *Thermodynamic properties, Equipment specifications, Fabrication, Product development, Test equipment.

For abstract, see STAR 10 21.

20N. Wave Propagation

AD-750 381 PC$3.00/MF$0.95
Harry Diamond Labs Washington D C
SCATTERING OF AN ELECTROMAGNETIC PULSE (EMP) BY APERTURES IN METAL STRUCTURES,
Werner J. Stark. 1972, 15p

Descriptors: (*Electromagnetic pulses, Scattering), Orifices, Electromagnetic shielding, Experimental design, Antenna apertures, Electromagnetic fields, Very high frequency, Transients.
Identifiers: *Electromagnetic scattering.

Previous work is done on the penetration of EMP through aperatures, included the investigation of the problem for specific geometries. The case examined in the present study is that of diffraction by a rectangular aperture in a structure. Suzuki applied the variational method for a rectangular aperture in an infinite plane to compute the transmission coefficient. The author also derived an approximate expression for the transmission coefficient for a long and narrow slot and was able to show excellent agreement with calculations using the variational method. The experimental method and theoretical analysis described in this report shows how Suzuki's analysis can be applied to estimate the EMP within a structure resulting from penetrations through rectangular apertures.

N72-30147 PC$3.00/MF$0.95
Ohio State Univ., Columbus. Dept. of Electrical Engineering.
A NUMERICAL STUDY OF ELECTROMAGNETIC SCATTERING FROM OCEAN LIKE SURFACES.
R. R. Lentz. Jul 72, 139p NASA-CR-2091, REPT-3030-1
Contract NAS1-9998

Descriptors: *Electromagnetic scattering, *Integral equations, *Ocean surface, Numerical analysis, Surface roughness effects, Wave scattering.

For abstract, see STAR 10 21.

21. PROPULSION AND FUELS

21B. Combustion and Ignition

AD-750 466 PC$3.00/MF$0.95
Air Force Office of Scientific Research Arlington Va
COMPILATION OF ABSTRACTS - 8TH AFOSR COMBINED CONTRACTOR'S MEETING ON COMBUSTION DYNAMICS RESEARCH HELD AT IIT RESEARCH INSTITUTE, CHICAGO, ILLINOIS ON 14-18 AUGUST 1972,
Hyla S. Napadensky. 14 Aug 72, 56p Rept no. AFOSR-TR-72-0653
See also report dated 10 Jul 68, AD-676 060.

Descriptors: (*Combustion, *Symposia), Solid rocket propellants, Liquid rocket propellants, Supersonic combustion, Detonations, Transport properties, Hypergolic ignition, Abstracts.
Identifiers: *Combustion stability, Gas dynamics.

The report consists of a collection of abstracts of the numerous research progress reports given by AFOSR contractors. These papers presented over a five-day period composed the 8th Annual Meeting of Combustion Dynamics Research. Each paper was grouped under one of the three major subject headings; Advanced Air Breathing Combustion; Liquid Propellant Rocket Combustion; or Solid Propellant Rocket Combustion. The principal investigators and their organizational association are also identified. (Author)

AD-750 982 PC$3.00/MF$0.95
Pratt and Whitney Aircraft West Palm Beach Fla Florida Research and Development Center
INVESTIGATION OF DAMPING METHODS FOR AUGMENTOR COMBUSTION INSTABILITY.
Final technical rept. 1 Mar 71-31 Oct 72,
Gary D. Garrison, P. L. Russell, and J. Stettler.
Oct 72, 101p Rept no. PWA-FR-5163 AFAPL-TR-72-84
Contract F33615-71-C-1361

Descriptors: (*Combustion chamber liners, Screaming combustion), Combustion chambers, Baffles, Flame holders, Acoustics, Oscillation, Damping, Afterburners, Combustion.
Identifiers: *Combustion instability, Augmentors.

Absorbing liners or 'screech' liners are commonly used in the augmentors currently being proposed and developed can experience low frequency instabilities for which liners of conventional design are an impractical solution because of the unacceptably large volumes required for the linear resonator cavity. The objective of this program was to develop practical augmentor acoustic devices for controlling low frequency combustion instabilities. Analysis, supported by cold flow impedance experiments, indicated that dimpled array liners, i.e., liners with punched and therefore lengthened apertures, complex-porous liners having facings of two different porous materials in series, and acoustic energy absorbing flameholders could provide sufficient abosrption. (Author)

N72-28914 PC$5.00/MF$0.95
Louisiana State Univ., Baton Rouge. Div. of Engineering Research.
PRACTICAL APPLICATION OF COMPUTER PROGRAMS FOR SUPERSONIC COMBUSTION.
F. R. Groves, Jr. Jun 72, 56p NASA-CR-112029
Contract NAS1-10341

Descriptors: *Boundary layer flow, *Computer programming, *Gas flow, Pressure gradients, Supersonic combustion.

For abstract, see STAR 10 19.

N72-28925 PC$6.25/MF$0.95
Naval Weapons Center, China Lake, Calif. Research Dept.
BERYLLIUM PARTICLE COMBUSTION.
Final Report
J. L. Prentice. Jun 72, 82p NASA-CR-127722, NWC-TP-5330
Subm- Sponsored in Part By Nasa

Descriptors: *Beryllium, *Combustion, *Gas mixtures, *Oxidizers, Drops (liquids), Laser heating.

For abstract, see STAR 10 19.

N72-30768 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
BURNUP DETERMINATION OF FUEL THROUGH FLUENCE MONITORING WITH COBALT.
E. Munch. Aug 72, 6p NASA-TT-F-14527
Contract NASW-2035
Tran- Transl. Into English From Atomwirtschaft (Duesseldorf), V. 16, No. 10, Oct. 1971 P 530-531

Descriptors: *Cobalt isotopes, *Gamma rays, *Nondestructive tests, *Nuclear fuel burnup, Fission products, Reactor physics, Spectroscopic analysis.

For abstract, see STAR 10 21.

21C. Electric Propulsion

N72-28791 PC$8.50/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Brunswick (West Germany). Inst. Fuer Elektrische Antriebe Und Energieversorgung.
THEORETICAL AND EXPERIMENTAL INVESTIGATIONS ON AN ELECTROSTATIC ION THRUSTER WITH 18 CM DIAMETER.
S. Baumgarth. 1972, 129p DLR-FB-72-09
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Electrostatic propulsion, *Ion engines, *Performance prediction, Energy dissipation, Ion production rates, Performance tests, Structural design.

For abstract, see STAR 10 19.

N72-29811 PC$3.00/MF$0.95
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics.
HUNTING ENERGY IN SPACE.
H. Alfven. Jun 72, 7p TRITA-EPP-72-16

Descriptors: *Electron guns, *Ion beams, *Spacecraft propulsion, Interplanetary space, Plasma jets.

For abstract, see STAR 10 20.

N72-29835 PC$3.75/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
ELEMENTS OF COST COMPARISON FOR PLANETARY MISSIONS WITH ADVANCED PROPULSION.
J. W. Stearns. 1 Jul 72, 33p NASA-CR-127754, JPL-TM-33-553
Contract NAS7-100

Descriptors: *Chemical propulsion, *Cost analysis, *Nuclear electric propulsion, *Space exploration, Jupiter probes, Space shuttles, Spacecraft launching.

For abstract, see STAR 10 20.

21D. Fuels

AD-750 484 PC$37.25/MF$0.95
Army Foreign Science and Technology Center Charlottesville Va
CONCISE DICTIONARY-HANDBOOK ON FUELS,
K. F. Kushnirenko. 21 Aug 72, 705p Rept no. FSTC-HT-23-1019-72
Trans. of mono. Kratkii Slovar-Spravochnik po Goryuchemu, Moscow, 1971 167p, by Elliott.

Descriptors: (*Fuels, *Dictionaries), Handbooks, Fuel pumps, Storage, Quality control, Refineries, Fuel additives, Gasoline, Coal, Combustion, USSR.
Identifiers: Natural gas, Manufactured gas, Translations.

The dictionary-handbook contains short definitions for several of the most widely used terms concerning the transportation pumping, storage, quality control and use of fuels, lubricating materials, and special liquids. Illustrations and tables are used for clarification and fuller information. Tables dealing with properties and characteristics of materials, and technical specifications of items and equipment are given. (Author)

AD-750 641 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
SELECTING LEAD ANTIKNOCK AGENTS FOR OBTAINING GASOLINES WITH A ROAD OCTANE NUMBER ABOVE 100,
J. M. Foster, and S. L. Goodacre. 16 Aug 72, 9p Rept no. FTD-HT-23-975-72
Edited trans. of mono. Kachestvo Motornykh i Reaktivnykh Topliv, Masel i Prisadok (Quality of Motor and Jet Fuels, Oils, and Additives) Moscow, 1970 p157-161, by Marilyn Olaechea.

Descriptors: (*Gasoline, Fuel Additives), (*Fuel additives, *Lead compounds), Mixtures, Metalorganic compounds, Test methods, USSR.
Identifiers: *Antiknock additives, *Tetraethyl lead, *Plumbane/tetramethyl, Comparison, *Octane number, Translations.

The report presents the results of comparative studies on the efficiency of lead antiknock agents: tetraethyl lead (TES), tetramethyl lead (TMS), a physical mixture of TES and TMS (F) and a chemical mixture of TES and TMS (Kh). The antiknock agents were added to three basic gasolines in different concentrations. The basic gasolines were formulated from components such that in a

pure form they had octane numbers of about 97 according to the test method and represented promising high-quality types of atuomobile gasolines. Butane was also added to the basic gasolines in quantities which complied with the existing standards for Super-Premium motor gasolines in England. (Author)

AD-750 985 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
POLYALUMINOXANES AS FUEL ADDITIVES,
V. V. Sher, P. I. Samin, M. M. Alimova, S. G. Arabyan, and I. A. Kholomonov. 25 Aug 72, 12p Rept no. FTD-HT-23-493-72
Edited trans. of Neftekhimiya (USSR) v11 n2 p278-281 1971.

Descriptors: (*Fuel additives, *Aluminum compounds), Salts, Internal combustion engines, Gasoline, Fatty acids, USSR.
Identifiers: Alcoholates, Translations, Breaking in operations.

Seven polyaluminoxanes, obtained by the interaction of aluminum isopropylate with various acids, were synthesized and characterized. On the basis of polyaluminoxanes which are soluble in hydrocarbons stable fuel additives were prepared with the help of a special stabilizer. Tests of the additives on a one-cylinder UMI-6-NATI installation showed their high degree of effectiveness; the use of additives reduced the time of the running in of engines under test conditions by approximately 30 times. (Author)

N72-29799 PC$3.25/MF$0.95
Royal Aircraft Establishment, Farnborough (England). Engineering Physics Dept.
SPONTANEOUS IGNITION OF AVTUR VAPOUR IN VARIOUS OXYGEN-NITROGEN MIXTURES.
J. T. Cansdale. 1972, 25p ARC-CP-1209, RAE-TR-71012
Misc 0supersedes Rae-tr-71012 Arc-32962

Descriptors: *Concorde aircraft, *Fuel tanks, *Ignition limits, *Spontaneous combustion, *Vapor pressure, Aircraft safety, Fuel tank pressurization, Kinetic heating, Nitrogen, Oxygen.

For abstract, see STAR 10 20.

PB-212 539 PC-GPO/MF$0.95-NTIS
Federal Trade Commission, Washington, D.C. Bureau of Economics.
INTERFUEL SUBSTITUTABILITY IN THE ELECTRIC UTILITY SECTOR OF THE U.S. ECONOMY.
Economic rept. no. 1,
Thomas D. Duchesneau. Feb 72, 93p FTC-R-6-15-15
Supersedes PB-208 536.
Paper copy available from GPO $0.45 as stock no. 1800-0145.

Descriptors: (*Fuels, *Competition), (*Electric power generation, Fuels), (*Electric utilities, Fuels), Fuel consumption, Substitutes, Marketing, Demand (Economics), Government policies, Energy, Coal, Fuel oil, Natural gas, Nuclear power plants, Cost analysis, Economic analysis.

Presented is a staff report to the Federal Trade Commission. The purpose of the report is to analyze the extent of interfuel substitution in order to establish, as precisely as possible, the product boundaries between the various energy sources. This analysis indicates whether the acquisition by oil companies supplying different fuels should be viewed as horizontal or conglomerate movements. The difference is critical to any policy formulation designed to assess the impact of the mergers on the state of competition. The report proceeds as follows: Examination of the present levels of energy use in the United States; Discussion of the major sources of energy and their relative importance within each sector of the economy; Discussion of the general principles used to define product boundaries of economic markets; Extensive analysis of interfuel substitution, actual and potential, in the electrical utility sector; and Conclusion which summarizes the results of the analysis with particular attention given to whether a merger between two firms producing different fuels is horizontal or conglomerate.

PB-212 555 PC-GPO/MF$0.95-NTIS
Bureau of Mines, Washington, D.C.
STORAGE STABILITY OF GASOLINE. DEVELOPMENT OF A STABILITY PREDICTION METHOD AND STUDIES OF GASOLINE COMPOSITION AND COMPONENT REACTIVITY,
F. G. Schwartz, M. L. Whisman, C. S. Allbright, and C. C. Ward. Sep 72, 64p BuMines-Bull-660
Prepared in cooperation with Bartlesville Energy Research Center, Oklahoma.
Paper copy available from GPO $0.60 as stock no. 2404-1030.

Descriptors: (*Gasoline, *Fuel storage), Automotive fuels, Stability, Fuel additives, Chemical reactions, Tetraethyl lead, Lead organic compounds, Bibliographies, Accelerated tests, Thermal stability, Tracer studies, Gas chromatography, Gums, Nomographs.

A cooperative research program concerned with the fundamentals of motor gasoline storage stability was undertaken to increase and accumulate fundamental information relating to fuel stability. A rapid and precise method was developed for predicting motor gasoline storage stability through a comprehensive program of investigation of fuel composition, component reactivity, lead alkyl reactions and application of these data to the ultimate design of the prediction test. This new method allows the estimation of useful life, with considerable accuracy, of gasolines stored for long periods under adverse conditions. A significant bibliography of related literature is included. (Author)

21E. Jet and Gas Turbine Engines

AD-750 513 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
CONTROLLING THE BOUNDARY LAYER IN HYPERSONIC AIR INTAKES,
D. A. Ogorodnikov, V. T. Grin, and N. N. Zakharov. 28 Jul 72, 14p Rept no. FTD-HT-23-1349-72
Edited trans. of International Symposium on Air-Breathing Engines, Marseille, 19-23 Jun 72. Papers, n.p., n.d., p1-8, by John A. Miller.

Descriptors: (*Turbojet inlets, *Boundary layer control systems), (*Supersonic combustion ramjet engines, Turbojet inlets), Hypersonic flow, Flow separation, Aerodynamic slots, Aerodynamic heating, Heat transfer, Secondary injection, France.
Identifiers: Translations.

An increase in the Mach number of airborne vehicles using airbreathing jet engines leads to a substantial decrease in the performance of the air intakes used in these engines. The main reason for the deterioration in performance is an increase in the influence of air viscosity. Despite the fact that the Mach number following compression in a hypersonic air intake intended for engines with supersonic combustion is greater than 1, the pressure ratio in it reaches p = 100 and higher. In principle, such a pressure ratio can be obtained in a system of weak compression shocks with relatively low levels of total-pressure losses. However, the realization of such compression involves the occurrence of separation of the boundary layer. To prevent separation of the boundary layer a system for controlling the boundary layer must be devised. (Author)

AD-750 645 PC$3.00/MF$0.95
General Motors Corp Indianapolis Ind Detroit Diesel Allison Div
T63-A-5A ENGINE MAINTAINABILITY AND RELIABILITY.
Quarterly summary rept. Jan-Mar 71,
G. C. Piper. Apr 71, 75p Rept no. DDAD-EDR-7105
Contract DAAJ01-70-C-0329

Descriptors: (*Gas turbines, Performance (Engineering)), (*Helicopters, Gas turbines), Helicopter engines, Maintainability, Maintenance, Scheduling, Turbine parts, Failure (Mechanics), Damage assessment, Life expectancy.
Identifiers: T-63 engines, T63-A-5A engines.

The report presents the results of mission and systems reliability investigations of in-service helicopter turbine engines.

AD-750 905 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE USE OF MIXED GASES AS THE WORKING BODIES OF CLOSED GAS-TURBINE INSTALLATIONS,
S. D. Tetelbaum, and A. M. Klok. 18 Aug 72, 15p Rept no. FTD-MT-24-1883-71
Edited machine trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Energetika (USSR) n4 p62-67 1971, by Lee D. Thompson.

Descriptors: (*Gas turbines, Thermodynamics), Thermodynamic cycles, Gas turbine regenerators, Heat transfer, Helium, Heat exchangers, Numerical analysis, USSR.
Identifiers: Translations, *Turbomachinery.

The addition of helium to various gases utilized as working bodies of closed gas turbine installations, allows for a decrease of the value of heat exchange surfaces. The efficiency in this case falls considerably less than with an increase in the temperature pressure heads. (2) The use as working bodies of mixtures of some gases with helium and hydrogen which, in principle will make it possible to create a closed gas turbine installations which will simultaneously have a higher efficiency and a lower value of sizes of heat exchange surfaces than when using pure gases, is advisable. (Author)

AD-750 910 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
AN EXAMINATION OF THE CURRENT UNITED STATES AIR FORCE AIRCRAFT ENGINE STATUS REPORTING SYSTEM.
Master's thesis,
James F. Brady, and Michael J. Scritchfield. Sep 72, 90p Rept no. SLSR-9-72

Descriptors: (*Aircraft engines, *Reports), (*Air Force, Logistics), Management engineering, Data processing systems, Decision making, Maintenance, Transportation, Advanced planning, Theses.
Identifiers: *Engine status reporting system, Data acquisition, *Systems modification.

By 1972, the United States Air Force has had an aircraft engine status reporting system for over twenty-two years. Since new advances in engine design could possibly overburden the system, a cross examination was made. The decision making environment of the Engine Item Manager was evaluated, along with the current reporting system. In addition, maintenance, supply, and transportation information systems were examined to see what parallel engine data they presented. As a result of this research, a new system was proposed that would eliminate the Engine Status Reporting System at a substantial saving to the Air Force. (Author)

AD-750 984 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio

DUCTED-FAN TURBOJET ENGINES (REVIEW OF DEVELOPMENT BASED ON FOREIGN PUBLICATIONS),
L. N. Golub. 29 Aug 72, 19p Rept no. FTD-HC-23-0813-72
Unedited rough draft trans. of Trudy Riiga. Nauchno-Teknicheskii Sbornik Trudov po Prikladnoi Gazotermodinamika (USSR) n89 p115-127 1966 (sic).

Descriptors: (*Turbofan engines, Performance (Engineering)), Ducted fans, Turbo-ramjets, Thermodynamic cycles, Turbine parts, Monopropellants, Reviews, USSR.
Identifiers: Translations.

The author analyzes operating principles and the thermodynamic cycle of turbofan rocket engines. Given is a brief analysis of the present state of turbofan rocket engines abroad, an analysis of design characteristics of a series of power plants, and basic diagrams of engines, their merits and shortcomings. Indicated are also the advantages of turbofan rocket engines at high supersonic-flight M numbers in comparison with other types of engines, as well as the possible field of application of turbofan rocket engines. (Author)

N72-28287 PC$3.25/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
INSTALLATION CAUSED FLOW DISTORTION AND ITS EFFECT ON NOISE FROM A FAN DESIGNED FOR TURBOFAN ENGINES.
F. P. Povinelli, and J. H. Dittmar. 1972, 21p
NASA-TM-X-68105, E-7043
Conf- Proposed for Presentation At 7th Aerodyn. Testing Conf., Palo Alto, Calif., 13-15 Sep. 1972 Sponsored By Aiaa

Descriptors: *Aircraft engines, *Engine noise, *Fans, *Flow distortion, Acoustic measurements, Inlet flow, Prediction analysis techniques.

For abstract, see STAR 10 19.

N72-28784 PC$3.25/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
APPLICATION OF AN EJECTOR TO THE SOLUTION OF THE DESIGN PROBLEM OF PROPULSION SYSTEMS OF HIGH-SPEED VTOL AIRCRAFT.
C. Storkebaum, and L. V. Bonin. Jun 72, 23p
NASA-TT-F-14305
Contract NASW-2035
Tran- Transl. Into English of Dfl, Brunswick Paper 64-573 From Proc. of the 4th Congr. of the Intern. Council of the Aeron. Sci. Washington, D. C., Spartan Books, Inc., 1965 P 555-573

Descriptors: *Ejectors, *Structural design, *Vertical takeoff aircraft, Ascent propulsion systems, Exhaust gases, Thrust loads.

For abstract, see STAR 10 19.

N72-28793 PC$3.00/MF$0.95
General Electric Co., Cincinnati, Ohio.
HIGHLY LOADED MULTI-STAGE FAN DRIVE TURBINE LEANED STATOR CONFIGURATION DESIGN.
D. C. Evans, and G. W. Wolfmeyer. Jul 72, 36p
NASA-CR-2096, R71AEG309
Contract NAS3-14304

Descriptors: *Aerodynamic configurations, *Lift devices, *Stators, *Turbofan engines, Aerodynamic loads, Performance tests, Stress analysis, Turbofans.

For abstract, see STAR 10 19.

N72-28795 PC$3.75/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NEW TECHNOLOGY IN TURBINE AERODYNAMICS.
A. J. Glassman, and T. P. Moffitt. 1972, 34p
NASA-TM-X-68115, E-7059
Conf- Proposed for Presentation At Turbomachinery Symp., College Station, Texas, 24-26 Oct. 1972

Descriptors: *Aerodynamics, *Computer techniques, *Turbines, Performance prediction, Subsonic flow, Transonic flow.

For abstract, see STAR 10 19.

N72-28796 PC$8.50/MF$0.95
Pratt and Whitney Aircraft, West Palm Beach, Fla.
SINGLE-STAGE EXPERIMENTAL EVALUATION OF TANDEM-AIRFOIL ROTOR AND STATOR BLADING FOR COMPRESSORS. PART 3 DATA AND PERFORMANCE FOR STAGE C.
J. A. Brent, and D. Clemmons. Aug 72, 127p
NASA-CR-120938, PWA-FR-5028
Contract NAS3-11158

Descriptors: *Compressor blades, *Performance tests, *Rotor blades (turbomachinery), Adiabatic conditions, Data reduction, Leading edges, Trailing edges.

For abstract, see STAR 10 19.

N72-28919 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPARISON OF HEAT-TRANSFER TEST DATA FOR A CHORDWISE-FINNED, IMPINGEMENT-COOLED TURBINE VANE TESTED IN A FOUR-VANE CASCADE AND A RESEARCH ENGINE.
H. J. Gladden, and F. C. Yeh. Jul 72, 38p
NASA-TM-X-2595, E-6870

Descriptors: *Air cooling, *Cooling fins, *Heat transfer, *J-75 engine, Cascade flow, Turbomachine blades, Turbulence effects.

For abstract, see STAR 10 19.

N72-28998 PC$5.00/MF$0.95
Royal Aircraft Establishment, Farnborough (England). Aerodynamics Dept.
EXPLORATORY TESTS ON A FORWARD-MOUNTED OVERWING ENGINE INSTALLATION.
D. J. Kettle, A. G. Kurn, and J. A. Bagley. 1972, 60p ARC-CP-1207, RAE-TR-70150
Misc 0supersedes Rae-tr-70150 Arc-32661

Descriptors: *Exhaust flow simulation, *Lift drag ratio, *Turbofan engines, *Wind tunnel models, Interference drag, Jet flow, Mounting, Nacelles, Pressure measurements, Transport aircraft, Wing flow method tests, Wing-fuselage stores.

For abstract, see STAR 10 20.

N72-29003 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COOLANT PRESSURE AND AIRFLOW DISTRIBUTION IN A STRUT-SUPPORTED TRANSPIRATION-COOLED VANE FOR A GAS TURBINE ENGINE.
A. Kaufman, D. J. Poferl, and H. T. Richards. Aug 72, 25p NASA-TN-D-6916, E-6800

Descriptors: *Flow distribution, *Gas turbine engines, *Pressure distribution, *Sweat cooling, Coolants, Fluid flow, Inlet flow, Mathematical models, Vanes.

For abstract, see STAR 10 20.

N72-29803 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DIGITAL-COMPUTER NORMAL SHOCK POSITION AND RESTART CONTROL OF A MACH 2.5 AXISYMMETRIC MIXED-COMPRESSION INLET.
G. H. Neiner, G. L. Cole, and D. J. Arpasi. Aug 72, 50p NASA-TN-D-6880, E-6498

Descriptors: *Digital systems, *Engine control, *Engine inlets, *Turbojet engines, Algorithms, Analog computers, Computer programs, Equipment specifications.

For abstract, see STAR 10 20.

N72-29806 PC$3.00/MF$0.95
General Electric Co., Cincinnati, Ohio.
HIGHLY LOADED MULTI-STAGE FAN DRIVE TURBINE-TANDEM BLADE CONFIGURATION DESIGN.
D. C. Evans, and G. W. Wolfmeyer. Aug 72, 67p
NASA-CR-2097
Contract NAS3-14304

Descriptors: *Engine design, *Performance tests, *Turbine blades, *Turbine engines, Stress analysis, Systems engineering, Vibration measurement.

For abstract, see STAR 10 20.

N72-29808 PC$8.00/MF$0.95
General Electric Co., Cincinnati, Ohio. Aircraft Gas Turbine Div.
EXPERIMENTAL QUIET ENGINE PROGRAM AERODYNAMIC PERFORMANCE OF FAN B.
R. G. Giffin, D. E. Parker, and L. W. Dunbar. Aug 72, 117p NASA-CR-72993
Contract NAS3-12430

Descriptors: *Aerodynamic characteristics, *Compressor rotors, Bypasses, Engine design, Performance tests.

For abstract, see STAR 10 20.

N72-30262 PC$19.25/MF$0.95
Pratt and Whitney Aircraft, East Hartford, Conn.
HIGH-LOADING LOW-SPEED FAN STUDY. 4 DATA AND PERFORMANCE WITH REDESIGN STATOR AND INCLUDING A ROTOR TIP CASING TREATMENT.
K. G. Harley, P. A. Odegard, and E. A. Burdsall. Jul 72, 341p NASA-CR-120866, PWA-4326
Contract NAS3-10483

Descriptors: *Casing, *Compressor rotors, *Performance tests, *Stators, Low speed, Noise reduction, Skewness, Slots, Stalling, Stator blades.

For abstract, see STAR 10 21.

N72-30774 PC$7.75/MF$0.95
Pratt and Whitney Aircraft, East Hartford, Conn.
HIGH-LOADING, 1800 FT/SEC TIP SPEED TRANSONIC COMPRESSOR FAN STAGE. 1 AERODYNAMIC AND MECHANICAL DESIGN.
A. L. Morris, J. E. Halle, and E. Kennedy. Sep 72, 115p NASA-CR-120907, PWA-4534
Contract NAS3-13493

Descriptors: *Blade tips, *Systems engineering, *Transonic compressors, Aerodynamic loads, Aircraft engines, Rotor aerodynamics.

For abstract, see STAR 10 21.

N72-30775 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE NASA QUIET ENGINES.
C. C. Ciepluch. 1972, 18p NASA-TM-X-68121, E-7086

Conf- Presented At Inter-noise 72, Washington, D. C., 4-6 Oct. 1972 Sponsored By Inst. of Noise Control Eng.

Descriptors: *Commercial aircraft, *Engine noise, *Noise reduction, *Subsonic aircraft, Acoustic ducts, Engine design, Nacelles, Performance tests.

For abstract, see STAR 10 21.

N72-30776 PC$3.25/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ON-THE-SHAFT DATA SYSTEMS FOR ROTATING ENGINE COMPONENTS.
D. J. Lesco, J. C. Sturman, and W. C. Nieberding. 1972, 23p NASA-TM-X-68112, E-7053
Conf- Presented At Symp. on Instrumentation for Airbreathing Propulsion, Monterey, Calif., 19-21 Sep. 1972

Descriptors: *Channels (data transmission), *Microelectronics, *Rotating shafts, *Transformers, Analog data, Digital systems, Engine design, Engine parts.

For abstract, see STAR 10 21.

N72-30777 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SEA-LEVEL EVALUATION OF DIGITALLY IMPLEMENTED TURBOJET ENGINE CONTROL FUNCTIONS.
D. J. Arpasi, D. S. Cwynar, and R. E. Wallhagen. Sep 72, 28p NASA-TN-D-6936, E-6977

Descriptors: *Digital systems, *Fuel flow, *Servocontrol, *Turbojet engines, Performance tests, System effectiveness, Transient response.

For abstract, see STAR 10 21.

N72-30778 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PROPULSION TECHNOLOGY FOR AN ADVANCED SUBSONIC TRANSPORT.
M. A. Beheim, R. J. Antl, and J. H. Povolny. Sep 72, 20p NASA-TM-X-2625, E-6913

Descriptors: *Engine design, *Transport aircraft, Noise reduction, Subsonic aircraft, Turbofan engines.

For abstract, see STAR 10 21.

21F. Nuclear Propulsion

N72-28565 PC$4.25/MF$0.95
Syracuse Univ. Research Corp., N.Y. Materials Science Lab.
ULTRA HIGH VACUUM ADHESION TESTING OF NERVA ENGINE MATERIALS.
Final Report, 1 Apr. - 30 Nov. 1969
Apr 70, 42p NASA-CR-127457, TID-25727
Contract UC-3245
Subm- Sponsored in Part By Nasa and Aec Prepared for Union Carbide Corp., Oak Ridge, Tenn.

Descriptors: *Adhesion tests, *Construction materials, *Nuclear engine for rocket vehicles, Graphite, Inconel (trademark), Materials science, Pyrolytic graphite.

For abstract, see STAR 10 19.

N72-28681 PC$6.00/MF$0.95
Versar, Inc., Springfield, Va.
INSTABILITIES IN URANIUM PLASMA AND THE GAS-CORE NUCLEAR ROCKET ENGINE.
Final Report
D. A. Tidman. May 72, 79p NASA-CR-127480
Contract NASW-2231

Descriptors: *Asymptotic methods, *Nuclear rocket engines, *Sound waves, *Uranium plasmas, Fission, Nonlinearity, Nuclear reactors.

For abstract, see STAR 10 19.

21G. Reciprocating Engines

AD-750 332 PC$3.00/MF$0.95
Military Academy West Point N Y
A MEANS OF INDUCING VARIABLE SWIRL AND INCREASED ENGINE EFFICIENCY IN THE STRATIFIED CHARGE WANKEL ENGINE,
Douglas M. Hoon. 1972, 9p

Descriptors: (*Internal combustion engines, Design), Engine air systems components, Fuel injection, Efficiency, Fluid flow, Combustion chamber gases, Pistons.
Identifiers: *Rotary piston engines, *Wankel engines, Rotors.

The paper proposes two engine modifications that the author believes will yield better performance. They combine variable swirl rates, exhaust-gas-recirculation, and more advantages of both the beetle and the deep pocket rotors than the author expects from the Curtiss-Wright combination. One is a new intake system; the other is a new rotor pocket design. (Author)

AD-750 935 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
THE PROBLEM OF SELECTING MATERIAL FOR THE VALVE SEATS OF CYLINDER HEADS OF THE SMD-14 ENGINE,
E. A. Sukhodolskaya, and E. Danilenko. 24 Aug 72, 9p Rept no. FTD-HC-23-0849-72
Edited trans. of Politekhnicheskii Institut, Kharkov. Vestnik (USSR) n47 p48-53 1970.

Descriptors: (*Tractor engines, *Engine cylinders), (*Valves, Wear resistance), Diesel engines, Reinforcing materials, Bushings, Thermal stresses, Manufacturing methods, USSR.
Identifiers: *Valve seats, Translations, SMD-14 engines.

Factors affecting the longevity of the valve seat pair in the SMD-14 tractor diesel are described. Material used to increase the wear resistance of this pair and for fabricating insert seats of the valves is listed. A study was made of a technique of increasing the wear resistance of the valve seat pair by reinforcing the cylinder block heads with special bushings. Requirements imposed on the material for these bushings are formulated, and results of studies on the use of certain materials are presented. It was found that the thermal stress of molten metal during casting of saddles leads to changes in the initial structure. This must be taken into account when choosing material for reinforced bushings. (Author)

AD-750 949 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
CORROSION WEAR IN MODERN ENGINES,
G. B. Rutenburg. 8 Sep 72, 19p Rept no. FTD-HT-23-968-72
Edited trans. from Avtomobilnaya Promyshlennost (USSR) n6 p6-8 1971, by Francis T. Russell.

Descriptors: (*Internal combustion engines, *Corrosion), Gasoline, Lubricants, Lubricant additives, Wear resistance, Engine cylinders, Starting, USSR.
Identifiers: Translations, ZIL-375 engines.

In the examination of the causes and measurements of engine wear, the author asserts that the possibilities of increasing operation intervals between repairs of Soviet engines through improved fuel and oil anticorrosion characteristics and by the use of automatic devices for controlling fuel have not been developed as much as they should. This is indicated by the fact that under the present GOST standard 2089-64, gasoline content of sulphur is higher wheras it is insignificant under American standards. With regard to abrasion wear of engines because of dust, this factor is seasonal in most sections of the Soviet Union. (Author)

21H. Rocket Motors and Engines

AD-750 554 PC$3.00/MF$0.95
Air Force Rocket Propulsion Lab Edwards AFB Calif
ADVANCED PROPULSION CONCEPTS - PROJECT OUTGROWTH.
Survey rept. 1 Jan-31 Dec 70,
Franklin B. Mead, Jr. Jun 72, 271p Rept no. AFRPL-TR-72-31

Descriptors: (*Space propulsion, Advanced planning), Rocket propellants, Electric propulsion, Nuclear propulsion, Lasers, Specific impulse, Particle accelerators, Electromagnetic drives.
Identifiers: Thermal propulsion, Chemical propulsion, Photon propulsion, Field propulsion, Detonation propulsion.

A study was conducted by an ad hoc group within the Air Force Rocket Propulsion Laboratory during the calendar year of 1970 in an attempt to predict the major propulsion developments that may occur in the next 30 to 40 years. The report evaluates the future of conventional chemical rocketry based on thermodynamic principles and revolutionary conceptual approaches to system applications. Advanced concepts falling under the general headings of Thermal, Field and Photon Propulsion are evaluated to a degree necessary to define their potential. The report does not define a long list of very near-term technology program subjects, but is designed to encourage and motivate talented and interested scientists and engineers to once again strive for advanced propulsion concepts. (Author)

AD-750 578 PC$20.75/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
PROPELLANT VALVES OF LIQUID-PROPELLANT ROCKET ENGINES,
A. I. Edelman. 29 Jun 72, 374p Rept no. FTD-MT-24-1463-71
Edited machine trans. of mono. Toplivnye Klapany Zhidkostnykh Raketnykh Dvigatelei (Propellant Valves of Liquid Rocket Engines) Moscow, 1970 p1-244, by John Sechovicz.

Descriptors: (*Rocket motors (Liquid propellant), Pneumatic valves), (*Pneumatic valves, Performance (Engineering)), Hydraulic valves, O-rings, Hydraulic seals, Turbopumps, Design, Test methods, USSR.
Identifiers: Translations, Propellant valves.

The book deals with problems in design and finish-off of automatic fuel units of liquid propellant rocket engines, specifications for these units and methods for their achievement. Analyzed are the effects of various factors on performance and reliability of units, as well as a series of standard designs of fuel valves. Given are testing methods, calculation principles and operating regulation of units. The book was written for specialists working in the field of design and operation of liquid-propellant rocket engines and their units. (Author)

AD-750 591 PC$3.00/MF$0.95
Army Missile Command Redstone Arsenal Ala Propulsion Directorate
COMPARISON OF PERFORMANCE OF A DOUBLE-CORNERED PLUG NOZZLE WITH A CONVENTIONAL CONVERGENT-DIVERGENT ROCKET NOZZLE.
Technical rept.,
Arnold T. Stokes. 30 Jun 72, 47p Rept no. RK-TR-72-17

Descriptors: (*Convergent divergent nozzles, Performance (Engineering)), (*Plug nozzles, Performance (Engineering)), (*Rocket motors (Solid propellant), *Thrust vector control systems), Rocket motor nozzles, Captive tests, Double base rocket propellants, Interior ballistics, Specific impulse, Erosive burning, Nozzle area ratio.
Identifiers: Performance evaluation.

The report presents performance data for double-cornered plug nozzles for comparison with convergent-divergent nozzles. A conventional convergent-divergent (C-D) nozzle was used to develop the propellant charge, ignition and ballistics, and as a baseline for plug nozzle performance evaluation. (Author)

AD-750 873 PC$3.00/MF$0.95
Air Force Rocket Propulsion Lab Edwards AFB Calif
CYCLE TESTING OF ACS VALVES IN CLF5.
Final rept. 1 Apr 70-June 72,
Garreth J. Gunderson. Aug 72, 109p Rept no. AFRPL-TR-72-82

Descriptors: (*Corrosive liquids, *Seals), (*Attitude control systems, *Valves), (*Liquid rocket oxidizers, Seals), Chlorine compounds, Fluorides, Check valves, Test methods, Carbides, Leakage (Fluid), Compatibility, Wear resistance, Borides, Metal seals, Iron, Nickel, Tungsten, Zirconium.
Identifiers: *Chlorine fluoride (ClF5), Valve seats, Poppet valves.

The report documents the complete test program conducted to establish a seat and poppet material (s) for use in chlorine pentafluoride (ClF5) attitude control system (ACS) valves. Test results of iron, nickel, tungsten, boron and zirconium based materials in the flat-on-flat sealing concept are discussed. Additionally, a sapphire/copper lip-seal concept and thin coatings of aluminum, tungsten and chromium on substrates, previously proved to be incompatible, were evaluated. In the tests conducted under this program, two carbides of tungsten and one of boron have successfully met the helium leakage requirement after 100,000 actuations in the ClF5 environment. (Author)

N72-28789 PC$3.00/MF$0.95
Aerojet Solid Propulsion Co., Sacramento, Calif.
A 156-IN.-DIA SRM MASS PROPERTIES REPORT.
10 Mar 72, 18p NASA-CR-123727,
REPT-1917-MP1
Contract NAS8-28428

Descriptors: *Booster rocket engines, *Rocket nozzles, *Weight (mass), Aerodynamic configurations, Nose cones, Tables (data).

For abstract, see STAR 10 19.

N72-28792 PC$3.50/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Lampoldshausen (West Germany). Inst. Fuer Chemische Raketenantriebe.
VELOCITY CAPABILITY OF THE SYMPHONIE-APOGEE-ENGINE-SYSTEM WITH BLOW DOWN OPERATION.
D. Manski. 1972, 29p DLR-MITT-72-12
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Apogees, *Mathematical models, *Rocket engines, *Symphonie satellites, *Velocity distribution, Computer programs, Mission planning.

For abstract, see STAR 10 19.

N72-29772 PC$13.75/MF$0.95
Martin Marietta Corp., Denver, Colo.
INVESTIGATION OF CHARACTERISTICS OF FEED SYSTEM INSTABILITIES.
Final Report
R. D. Vaage, L. E. Fidler, and R. A. Zehnle. May 72, 231p NASA-CR-123752, MCR-72-107
Contract NAS8-26266

Descriptors: *Feed systems, *Pogo effects, *Resonant frequencies, *Spacecraft propulsion, *Spacecraft structures, Cavitation flow, Prediction analysis techniques, Turbine pumps.

For abstract, see STAR 10 20.

N72-29804 PC$8.00/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
DEVELOPMENT AND TESTING OF THE PROPULSION SUBSYSTEM FOR THE MARINER MARS 1971 SPACECRAFT.
R. D. Cannova. 1 Aug 72, 118p NASA-CR-127751, JPL-TM-33-552
Contract NAS7-100

Descriptors: *Mariner 9 space probe, *Spacecraft propulsion, *Thrust control, Ground support equipment, Performance tests, Systems engineering, Trajectory control.

For abstract, see STAR 10 20.

N72-29805 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
OPTIMIZATION CRITERIA FOR LOW--THRUST ENGINES OF LIMITED POWER AND A METHOD FOR THEIR IDENTIFICATION.
Aug 72, 20p
NASA-TT-F-14384
Tran- Transl. Into English From the Publ. Upravleniye Kosmicheskimi Apparatami I Korablyami Moscow, Nauka, 1971 P 377-390

Descriptors:

For abstract, see STAR 10 20.

N72-29955 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DESIGN AND EVALUATION OF AN OXIDANT--FUEL-RATIO-ZONED ROCKET INJECTOR FOR HIGH PERFORMANCE AND ABLATIVE ENGINE COMPATIBILITY.
J. M. Winter, A. J. Pavli, and A. M. Shinn, Jr. Aug 72, 59p NASA-TN-D-6918, E-6945

Descriptors: *Ablation, *Combustion chambers, *Rocket engine design, *Temperature control, Ceramics, Combustion physics, Performance tests, Zirconium oxides.

For abstract, see STAR 10 20.

21I. Rocket Propellants

AD-750 551 PC$3.00/MF$0.95
Lockheed Propulsion Co Redlands Calif
HTPB POLYMER IMPROVEMENT.
Technical rept. 1 May-31 Aug 72,
W. D. Allan, W. E. Baumgartner, and G. E. Myers. Sep 72, 43p Rept no. LPC-625-I-2 AFRPL-TR-72-89
Contract F04611-72-C-0038

Descriptors: (*Solid rocket propellants, Butadienes), Test methods, Polymerization, Viscosity, Tensile properties, Crack propagation.
Identifiers: *Hydroxy terminated polybutadiene, *Polybutadiene.

The commerically available R-45M hydroxy terminated polybutadiene (HTPB) prepolymer is being extensively studied for applications in highly loaded solid propellants. It has some deficiencies, however, in potlife control and in balancing mechanical properties at low and high temperatures, which presumably are caused by the material's low molecular weight, high functionality, and high reactivity of its functional groups. The report concerns a study to determine whether the available variations in ARCO's free radical polymerization process could produce a modified R-45M possessing superior characteristics for use in solid propellants. Pilot plant samples were studied.

AD-750 900 PC$3.00/MF$0.95
Rocketdyne Canoga Park Calif
STABILIZATION OF MHF-8 MONOPROPELLANT.
Final rept. 13 Sep 71-13 Jul 72,
Arthur E. Axworthy, and Ross I. Wagner. Nov 72, 78p Rept no. R-9048 AFRPL-TR-72-90
Contract F04611-72-C-0006

Descriptors: (*Monopropellants, Decomposition), (*Hydrazine derivatives, *Decomposition), Hydrazine, Ammonia, Liquid rocket propellants, Liquid rocket fuels, Mixtures, Storage, Stability, Reaction kinetics, Compatibility, Steel, Aluminum alloys, Titanium alloys, Test methods.
Identifiers: MHF-8 propellant, Aluminum alloy 2319, Aluminum alloy 1100, Titanium alloy 6Al 4V.

Long-term storability and decomposition kinetics of monopropellant formulations containing hydrazine, hydrazine azide, and ammonia were investigated. These propellants were found to be incompatible with steel alloys but quite compatible with 2319 aluminum, 1100 aluminum, and Ti-6Al-4V. In addition, the nature of the decomposition mechanisms and the stoichiometries involved were investigated. Methods of improving the compatibility with stainless steels were tested. (Author)

N72-28787 PC$15.25/MF$0.95
Lockheed Missiles and Space Co., Sunnyvale, Calif. Space Systems Div.
LIQUID PROPELLANT THERMAL CONDITIONING SYSTEM TEST PROGRAM.
Final Report
B. R. Bullard. 5 Jul 72, 265p NASA-CR-72971, LMSC-D159262
Contract NAS3-12033

Descriptors: *Liquid hydrogen, *Temperature control, Condensing, Pressurizing, Weightlessness.

For abstract, see STAR 10 19.

N72-28916 PC$3.00/MF$0.95
Office National Detudes Et de Recherches Aerospatiales, Paris (France).
MEASUREMENT OF THE RADIATION FLUX AT THE IGNITION OF SOLID PROPELLANTS.
J. Crabol. 1972, 10p ONERA-TP-1067
Conf- Presented At the 4th Natl. Calorimetry Meeting of the French Soc. of Thermal Physicists, Paris, 4-5 May 1972

Descriptors: *Heat flux, *Heat transmission, *Measuring instruments, *Solid propellant ignition, Dynamic characteristics, Heat measurement, Time response.

For abstract, see STAR 10 19.

N72-29773 PC$26.50/MF$0.95
Fraunhofer-gesellschaft Zur Forderung Der Angewandten Forschung E. V., Berghausen (West (Germany).
LIFETIME OF ROCKET PROPELLANTS, GUN PROPELLANTS, AND EXPLOSIVE CHARGES.
1972, 486p
LANG- PARTLY IN GERMAN PARTLY IN FRENCH AND PARTLY IN ENGLISH

Descriptors: *Conferences, *Explosives, *Gun propellants, *Service life, *Solid propellants, *Storage stability, Binders (materials), Differential thermal analysis, Mechanical properties, Propellant decomposition, Propellant storability, Pyrotechnics, Rocket engines, Rocket propellants.

For abstract, see STAR 10 20.

N72-29795 PC$7.00/MF$0.95
Institut Fuer Chemie Der Treibstoffe, Berghausen (West Germany).
DURABILITY DETERMINATION OF SOLID ROCKET PROPELLANTS. PROBLEM FORMULATION AND TEST PLANNING . DIE BESTIMMUNG DER LEBENSDAUER VON RAKETEN-FESTTREIBSTOFFEN. PROBLEMSTELLUNG UND VERSUCHSPLANUNG.
D. Schmitt, H. Schubert, and F. Volk. 31 Dec 71, 98p ICT-T-MITT-11/71

Descriptors: *Composite propellants, *Double base rocket propellants, *Life (durability), *Propellant storage, Environmental tests, Nitric acid, Propellant binders, Propellant decomposition, Storage stability.

For abstract, see STAR 10 20.

N72-29796 PC$4.50/MF$0.95
Institut Fuer Chemie Der Treibstoffe, Berghausen (West Germany).
PHYSICAL FACTORS INFLUENCING THE EMBRITTLEMENT OF SOLID PROPELLANTS AND PROPELLANT POWDERS DESIGN OF A TEST PLAN . PHYSIKALISCHE EINFLUSS-FAKTOREN AUF DAS VERSPROEDUNGSVERHALTEN VON FESTTREIBSTOFFEN UND TREIBLADUNGSPULVERN AUFSTELLUNG EINES VERSUCHSPLANS.
D. Schmitt. 31 Dec 71, 48p ICT-8/71

Descriptors: *Double base propellants, *Embrittlement, *Humidity, *Notch tests, *Solid propellants, Ambient temperature, Shear properties, Solid propellant ignition, Tensile strength, Tensile tests, Testing time.

For abstract, see STAR 10 20.

N72-29797 PC$3.25/MF$0.95
Explosives Research and Development Establishment, Waltham Abbey (England).
FACTORS GOVERNING THE STORAGE LIFE OF SOLID PROPELLANT ROCKET MOTORS.
R. Stenson. Feb 72, 23p ERDE-TN-47, BR-29470

Descriptors: *Composite propellants, *Double base rocket propellants, *Propellant storage, *Solid propellant rocket engines, Chemical effects, Propellant properties, Propellant tests, Safety factors, Service life, Storage stability, Temperature effects.

For abstract, see STAR 10 20.

N72-29798 PC$4.25/MF$0.95
Explosives Research and Development Establishment, Waltham Abbey (England).
PARALLEL PLATE PLASTOMETRY OF PLASTIC PROPELLANT. PART 2 DETERMINATION OF PLASTOVISCOSITY AND FLOW CURVE EQUATIONS.
V. M. Gledhill, and W. A. Dukes. Jan 72, 42p ERDE-TR-87, BR-29465

Descriptors: *Parallel plates, *Plastic propellants, *Strain rate, *Viscosity, Axial strain, Cylindrical bodies, Rheology, Shear stress.

For abstract, see STAR 10 20.

N72-30772 PC$4.00/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
STABILITY EVALUATION OF A ROCKET ENGINE FOR GASEOUS OXYGEN DIFLUORIDE (OF2) AND GASEOUS DIBORANE (B2H6) PROPELLANTS.
R. M. Clayton. 15 Aug 72, 40p NASA-CR-127859, JPL-TR-32-1561
Contract NAS7-100

Descriptors: *Gaseous rocket propellants, *Stability, Combustion chambers, Damping, Diborane, Oxygen fluorides.

For abstract, see STAR 10 21.

N72-30797 PC$3.50/MF$0.95
North American Rockwell Corp., Downey, Calif. Space Div.
IN-SPACE PROPELLANT SYSTEMS SAFETY. VOLUME 1 EXECUTIVE SUMMARY.
23 Jun 72, 26p NASA-CR-123764, SD-72-SA-0054-1-VOL-1
Contract NAS8-27692

Descriptors: *Cryogenic rocket propellants, *Logistics, *Safety, Spacecraft propulsion, Systems analysis.

For abstract, see STAR 10 21.

N72-30798 PC$6.50/MF$0.95
North American Rockwell Corp., Downey, Calif. Space Div.
IN-SPACE PROPELLANT SYSTEMS SAFETY. VOLUME 2 SYSTEM SAFETY GUIDELINES AND REQUIREMENTS.
23 Jun 72, 86p NASA-CR-123766, SD-72-SA-0054-2-VOL-2
Contract NAS8-27692

Descriptors: *Cryogenic rocket propellants, *Logistics, *Safety, Spacecraft propulsion, Systems analysis.

For abstract, see STAR 10 21.

N72-30799 PC$30.00/MF$0.95
North American Rockwell Corp., Downey, Calif. Space Div.
IN-SPACE PROPELLANT SYSTEMS SAFETY. VOLUME 3 SYSTEM SAFETY ANALYSIS.
23 Jun 72, 558p NASA-CR-123769, SD-72-SA-0054-3-VOL-3
Contract NAS8-27692

Descriptors: *Cryogenic rocket propellants, *Logistics, *Safety, Optimization, Spacecraft propulsion, Systems analysis.

For abstract, see STAR 10 21.

N72-30800 PC$3.75/MF$0.95
North American Rockwell Corp., Downey, Calif. Space Div.
IN-SPACE PROPELLANT LOGISTICS. VOLUME 1 EXECUTIVE SUMMARY.
Final Report, 25 Jun. 1971 - 23jun. 1972
23 Jun 72, 33p NASA-CR-123784, SD-72-SA-0053-1-VOL-1
Contract NAS8-27692

Descriptors: *Cryogenic fluid storage, *Cryogenic rocket propellants, *Systems analysis, Logistics, Operational problems, Space shuttles, Space tugs.

For abstract, see STAR 10 21.

N72-30801 PC$24.00/MF$0.95
North American Rockwell Corp., Downey, Calif. Space Div.
IN-SPACE PROPELLANT LOGISTICS. VOLUME 2 TECHNICAL REPORT.
23 Jun 72, 438p NASA-CR-123767, SD-72-SA-0053-2-VOL-2
Contract NAS8-27692

Descriptors: *Cryogenic fluid storage, *Cryogenic rocket propellants, *Systems analysis, Logistics, Operational problems, Space shuttles, Space tugs.

For abstract, see STAR 10 21.

N72-30802 PC$14.00/MF$0.95
North American Rockwell Corp., Downey, Calif. Space Div.
IN-SPACE PROPELLANT LOGISTICS. VOLUME 3 TRADE STUDIES.
23 Jun 72, 240p NASA-CR-123749, SD-72-SA-0053-3-VOL-3
Contract NAS8-27692

Descriptors: *Cryogenic fluid storage, *Cryogenic rocket propellants, *Systems analysis, Logistics, Operational problems, Space shuttles, Space tugs.

For abstract, see STAR 10 21.

N72-30803 PC$7.25/MF$0.95
North American Rockwell Corp., Downey, Calif. Space Div.
IN-SPACE PROPELLANT LOGISTICS. VOLUME 4 PROJECT PLANNING DATA.
23 Jun 72, 101p NASA-CR-123768, SD-72-SA-0053-4-VOL-4
Contract NAS8-27692

Descriptors: *Cryogenic rocket propellants, *Logistics, *Modules, *Systems analysis, Cryogenic fluid storage, Operational problems, Space shuttles, Space tugs.

For abstract, see STAR 10 21.

N72-30945 PC$3.25/MF$0.95
Pennsylvania State Univ., University Park. Dept. of Mechanical Engineering.
INVESTIGATION OF CRITICAL BURNING OF FUEL DROPLETS.
Semiannual Report, 1 Jan. - 30 Jun. 1972
C. B. Allison, and G. S. Canada. 30 Jun 72, 24p NASA-CR-127818
Contract NSR-39-009-077

Descriptors: *Burning rate, *Combustion, *Liquid rocket propellants, High pressure, Hydrazines.

For abstract, see STAR 10 21.

N72-30959 PC$7.25/MF$0.95
North American Rockwell Corp., Downey, Calif.
STUDY OF SPRAY DISINTEGRATION IN ACCELERATING FLOW FIELDS.
Final Report
W. H. Nurick. Jun 72, 101p NASA-CR-114479, R-9017
Contract NAS2-6494

Descriptors: *Atomizing, *Flow velocity, *Gas flow, *Propellant combustion, Cold flow tests, Mathematical models, Oxygen.

For abstract, see STAR 10 21.

22. SPACE TECHNOLOGY

22A. Astronautics

AD-750 555 PC$4.00/MF$0.95
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
OPTIMIZATION OF SATELLITE GRAVITATIONAL STABILIZATION SYSTEMS.
R. E. Gibson Library bulletin translation series, V. A. Sarychev, and K. V. Lukanin. 15 Mar 72, 37p Rept no. APL-CLB-3-T-651
N00017-70-C-4401
Trans. of Institut Prikladnoi Matematiki, Moscow. Preprint (USSR) n54 1971, by L. Holtschlag.

Descriptors: (*Satellite attitude, Attitude control systems), (*Satellites (Artificial), Stabilization), Gravity, Gyro stabilizers, Damping, Equations of motion, Oscillation, USSR.
Identifiers: Translations, Gravity gradient satellites.

A study is made of the dynamics of satellite gravitational stabilization systems with gyrodamping and two types of purely passive dampers. The greatest attention is devoted to examination of motion in the orbital plane. The parameters which yield maximum stability and those ensuring minimum amplitude of the eccentricity oscillations of a satellite for a specified degree of stability are determined. The three-dimensional motion is studied for the satellite-stabilizer system and the problem of increasing the speed of response and the accuracy of the system by introducing a damper in a special way is examined. (Author)

N72-28093 PC$51.75/MF$0.95
Urs/Matrix Co., Huntsville, Ala. Man Systems Div.
DEVELOPMENT OF FLIGHT EXPERIMENT TASK REQUIREMENTS. VOLUME 2 TECHNICAL REPORT. PART 2 APPENDIX H TASKS--SKILLS DATA SERIES.
Final Report
G. R. Hatterick. 1 Jun 72, 992p NASA-CR-127470, PRL-189-VOL-2-PT-2
Contract NASW-2192

Descriptors: *Mission planning, *Space shuttle orbiters, *Spacecrews, Experimental design, Human factors engineering, Task complexity.

For abstract, see STAR 10 19.

N72-28818 PC$16.25/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
APOLLO 14 MISSION REPORT. SUPPLEMENT 7 INFLIGHT DEMONSTRATIONS.
Jan 72, 284p NASA-TM-X-68691, NASA-TM-X-2410

Descriptors: *Apollo 14 flight, *Casting, *Electrophoresis, *Heat transmission, *Liquids, Composite materials, Convective heat transfer.

For abstract, see STAR 10 19.

N72-28827 PC$13.75/MF$0.95
TRW Systems Group, Redondo Beach, Calif.
STUDY OF A COMET RENDEZVOUS MISSION, VOLUME 1.
Final Technical Report
12 May 72, 231p NASA-CR-127562, TRW-20513-6006-R0-00-VOL-1
Contracts NAS7-100, JPL-953247
Subm- Prepared for Jpl

Descriptors: *Comets, *Mission planning, *Space rendezvous, Interplanetary flight, Interplanetary spacecraft, Interplanetary trajectories, Rendezvous spacecraft, Solar propulsion.

For abstract, see STAR 10 19.

N72-28828 PC$6.00/MF$0.95
TRW Systems Group, Redondo Beach, Calif.
STUDY OF A COMET RENDEZVOUS MISSION. VOLUME 2 APPENDICES.
12 May 72, 78p NASA-CR-127561, TRW-20513-6006-R0-00-VOL-2
Contracts NAS7-100, JPL-953247
Subm- Prepared for Jpl

Descriptors: *Comets, *Mission planning, *Research, *Space rendezvous, Interplanetary flight, Interplanetary spacecraft, Rendezvous spacecraft, Systems analysis.

For abstract, see STAR 10 19.

N72-28829 PC$5.00/MF$0.95
Teledyne Brown Engineering, Huntsville, Ala.
SKYLAB EXPERIMENT PERFORMANCE EVALUATION MANUAL. APPENDIX P EXPERIMENT T003 INFLIGHT AEROSOL ANALYSIS (DOT/MSFC).
K. S. Purushotham. Jul 72, 59p NASA-CR-61386
Contract NAS8-21804

Descriptors: *Aerosols, *Manuals, *Skylab program, Preflight analysis, Spacecraft cabin atmospheres.

For abstract, see STAR 10 19.

N72-28832 PC$18.25/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
APOLLO 15 MISSION REPORT.
Dec 71, 325p NASA-TM-X-68394, MSC-05161

Descriptors: *Apollo 15 flight, *Command service modules, *Extravehicular activity, *Lunar exploration, *Lunar module, Apollo lunar surface experiments package, Bioastronautics, Ground support systems, Intravehicular activity, Lunar communication, Lunar roving vehicles.

For abstract, see STAR 10 19.

N72-28838 PC$19.75/MF$0.95
Lockheed Missiles and Space Co., Sunnyvale, Calif. Space Systems Div.
LUNAR MISSION SAFETY AND RESCUE ESCAPE/RESCUE ANALYSIS AND PLAN.
15 Jul 71, 353p NASA-CR-115415, MSC-03978-REV-1
Contract NAS9-10969

Descriptors: *Escape (abandonment), *Lunar flight, *Rescue operations, *Safety management, *Survival, Air locks, Astronauts, Lunar bases, Lunar surface vehicles, Mission planning, Pressure suits.

For abstract, see STAR 10 19.

N72-28839 PC$22.75/MF$0.95
Lockheed Missiles and Space Co., Palo Alto, Calif. Space Systems Div.
LUNAR MISSION SAFETY AND RESCUE HAZARDS ANALYSIS AND SAFETY REQUIREMENTS.
15 Jul 71, 413p NASA-CR-115416, MSC-03977
Contract NAS9-10969

Descriptors: *Astronauts, *Hazards, *Lunar flight, Aborted missions, Failure, Leakage, Lunar bases, Lunar communication, Lunar surface vehicles, Mission planning.

For abstract, see STAR 10 19.

N72-28840 PC$3.25/MF$0.95
Lockheed Missiles and Space Co., Sunnyvale, Calif. Space Systems Div.
LUNAR MISSION SAFETY AND RESCUE EXECUTIVE SUMMARY.
15 Jul 71, 24p NASA-CR-115417, MSC-03975-REV-1
Contract NAS9-10969

Descriptors: *Escape (abandonment), *Hazards, *Lunar flight, *Rescue operations, *Safety management, Astronauts, Mission planning, Survival.

For abstract, see STAR 10 19.

N72-28841 PC$10.75/MF$0.95
Lockheed Missiles and Space Co., Sunnyvale, Calif. Space Systems Div.
LUNAR MISSION SAFETY AND RESCUE TECHNICAL SUMMARY.
15 Jul 71, 174p NASA-CR-115418, MSC-03976-REV-1
Contract NAS9-10969

Descriptors: *Escape (abandonment), *Hazards, *Lunar flight, *Rescue operations, *Safety management, Astronauts, Mission planning, Survival.

For abstract, see STAR 10 19.

N72-28842 PC$3.50/MF$0.95
Library of Congress, Washington, D.C.
CURVED ROADS TO SPACE.
Jul 72, 27p NASA-TT-F-14533
Tran- Transl. Into English of A Russian Film Text Moscow, Soviet Central Sci. Film Enterprise, 1972 26 P

Descriptors: *Accidents, *Cosmonauts, *U.S.S.R. space program, Death, Pressure reduction, Salyut space station.

For abstract, see STAR 10 19.

N72-28845 PC$6.25/MF$0.95
Army Engineer Waterways Experiment Station, Vicksburg, Miss.
PERFORMANCE OF BOEING LRV WHEELS IN A LUNAR SOIL SIMULANT. REPORT 1 EFFECT OF WHEEL DESIGN AND SOIL.
A. J. Green, and K. Melzer. Dec 71, 83p
NASA-CR-127695, M-71-10
NASA ORDER H-68683-A
Misc 0supersedes M-70-15

Descriptors: *Lunar roving vehicles, *Lunar soil, *Performance tests, *Vehicle wheels, Manned lunar surface vehicles, Soil mechanics, Space environment simulation.

For abstract, see STAR 10 19.

N72-28881 PC$10.75/MF$0.95
TRW Systems Group, Redondo Beach, Calif.
PARTICLES AND FIELDS SUBSATELLITE PROGRAM.
Final Report
H. J. Horn. Feb 72, 175p NASA-CR-115677, TRW-8220.57-1-68
Contract NAS9-10800

Descriptors: *Apollo project, *Lunar orbits, *Lunar satellites, *Magnetosphere, *Solar wind, Mission planning, Space missions, Spacecraft design, Unmanned spacecraft.

For abstract, see STAR 10 19.

N72-28891 PC$15.50/MF$0.95
Boeing Co., Houston, Tex.
USERS GUIDE FOR GUIDANCE AND CONTROL LAUNCH AND ABORT SIMULATION FOR SPACECRAFT (LASS), VOLUME 2.
30 Jun 72, 267p
Contract NASA-CR-115717, D2-118387-2A-VOL-2

Descriptors: *Spacecraft guidance, *Spacecraft instruments.

For abstract, see STAR 10 19.

N72-28905 PC$3.00/MF$0.95
Southwest Research Inst., San Antonio, Tex. Dept. of Mechanical Sciences.
COUPLING BETWEEN STRUCTURE AND LIQUIDS IN A PARALLEL STAGE SPACE SHUTTLE DESIGN.
D. D. Kana, W. L. Ko, P. H. Francis, and A. Nagy.
5 Jul 72, 18p NASA-CR-127631, AIAA-PAPER-72-347-REV
Contract NAS1-9890
Misc 0revised

Descriptors: *Force distribution, *Liquid rocket propellants, *Space shuttles, Liquid sloshing, Scale models, Stress analysis, Structural analysis.

For abstract, see STAR 10 19.

N72-28972 PC$7.00/MF$0.95
Lockheed Missiles and Space Co., Sunnyvale, Calif.
PROCUREMENT SPECIFICATIONS REPORT. IMBLS PHASE B-4.
9 Dec 70, 100p NASA-CR-115720, LMSC-A977461
Contract NAS9-10742

Descriptors: *Aerospace systems, *Cost estimates, *Equipment specifications, *Procurement management, Aerospace engineering, Cost effectiveness, Instruments, Product development, Production engineering.

For abstract, see STAR 10 19.

N72-28980 PC$3.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
ADVANCED TECHNOLOGY AND EUROPEAN UNITY.
R. Bloch. Jul 72, 18p NASA-TT-F-14354
Tran- Transl. Into English From Laeronautique Et Lastronautique (Paris), No. 35, 1972 P 5-11

Descriptors: *Europe, *International cooperation, *Technological forecasting, Aerospace engineering, Aerospace industry, Aircraft configurations, Missile configurations, Space exploration, Technology assessment.

For abstract, see STAR 10 19.

N72-29827 PC$6.00/MF$0.95
Pennsylvania State Univ., University Park.
DYNAMICS AND CONTROL OF ESCAPE AND RESCUE FROM A TUMBLING SPACECRAFT.
Semiannual Progress Report, 1 Dec. 1971 31 May 1972
M. H. Kaplan. Jun 72, 76p NASA-CR-127808, SAPR-2
Contract NGR-39-009-210

Descriptors: *Rescue operations, *Spacecraft control, *Spacecraft motion, *Tumbling motion, Energy dissipation, Flexibility, Fluid jets, Spacecraft docking.

For abstract, see STAR 10 20.

N72-29829 PC$7.75/MF$0.95
Essex Corp., Alexandria, Va.
TELEOPERATOR SYSTEM MAN-MACHINE INTERFACE REQUIREMENTS FOR SATELLITE RETRIEVAL AND SATELLITE SERVICING. VOLUME 1 REQUIREMENTS.
Final Report
T. B. Malone. Jun 72, 113p NASA-CR-123754
Contract NASW-2220

Descriptors: *Man machine systems, *Satellites, *Spacecraft recovery, *Teleoperators, Human factors engineering, Space maintenance, Space shuttles.

For abstract, see STAR 10 20.

N72-29830 PC$10.25/MF$0.95
Essex Corp., Alexandria, Va.
TELEOPERATOR SYSTEM MAN-MACHINE INTERFACE REQUIREMENTS FOR SATELLITE RETRIEVAL AND SATELLITE SERVICING. VOLUME 2 DESIGN CRITERIA.
Final Report
T. B. Malone. Jun 72, 142p NASA-CR-123755
Contract NASW-2220

Descriptors: *Man machine systems, *Space logistics, *Space shuttles, *Spacecraft recovery, *Teleoperators, Display devices, Human factors engineering, Manipulators, Numerical control, Space maintenance, Tradeoffs.

For abstract, see STAR 10 20.

N72-29833 PC$5.25/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PROBABILITY OF SATELLITE COLLISION.
J. W. Mccarter. 8 Jun 72, 65p NASA-TM-X-64671

Descriptors: *Earth satellites, *Probability theory, *Space stations, Collision avoidance, Collisions, Parameterization.

For abstract, see STAR 10 20.

N72-29839 PC$5.25/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
APOLLO 15 CONTAMINATION PHOTOGRAPHY.
R. J. Naumann. 5 Jul 72, 62p NASA-TM-X-64681

Descriptors: *Apollo 15 flight, *Ice, *Optical measurement, *Photometry, Brightness, Densitometers, Dumping, Sunlight.

For abstract, see STAR 10 20.

N72-29859 PC$7.75/MF$0.95
Mcdonnell-douglas Astronautics Co., Huntington Beach, Calif.
SPACE STATION USERS HANDBOOK.
Space Station Phase B Extension Period Study
Jan 72, 111p NASA-CR-123758, MDC-G2580
Contract NAS8-25140

Descriptors: *Handbooks, *Mission planning, *Research projects, *Space missions, *Space stations, Spacecraft configurations, Systems analysis, Test equipment, Test facilities.

For abstract, see STAR 10 20.

N72-29860 PC$7.50/MF$0.95
Mcdonnell-douglas Astronautics Co., Huntington Beach, Calif.
SPACE STATION USERS HANDBOOK (REVISED).
Feb 72, 107p NASA-CR-123753, MDC-G2580-REV
Contract NAS8-25140

Descriptors: *Mission planning, *Space missions, *Space stations, *Test facilities, Aerospace sciences, Biomedical data, Data acquisition, Research projects.

For abstract, see STAR 10 20.

N72-30220 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
SOVIET WORK ON AUTOMATIC CONTROL IN OUTER SPACE (1957 - 1967).
B. N. Petrov, and B. V. Raushenbakh. Jul 72, 17p NASA-TT-F-14379
Contract NASW-2035
Tran- Transl. Into English From Trans. of the 2d Intern. Symp. of Ifac for Autom. Control in the Peaceful Use of Outer Space, Vienna, Sep. 1967 Moscow, Nauka Press, 1971 P 11-18

Descriptors: *Automatic control, *Control equipment, *Histories, *Space exploration, Launch vehicles, Satellite control, Space flight, Space probes, U.S.S.R..

For abstract, see STAR 10 21.

N72-30585 PC$10.00/MF$0.95
Texas Univ., Austin. Applied Mechanics Research Lab.
NAVIGATION STRATEGY AND FILTER DESIGN FOR SOLAR ELECTRIC MISSIONS.
B. D. Tapley, and H. Hagar, Jr. May 72, 156p NASA-CR-127860, AMRL-1040
Contract NAS7-100
Subm- Prepared for Jpl

Descriptors: *Inertial navigation, *Low thrust propulsion, *Space navigation, Algorithms, Flight simulation, Signal to noise ratios.

For abstract, see STAR 10 21.

N72-30804 PC$11.25/MF$0.95
North American Rockwell Corp., Downey, Calif. Space Div.
SAFETY IN EARTH ORBIT STUDY. VOLUME 1 TECHNICAL SUMMARY.
Final Report
12 Jul 72, 184p NASA-CR-128507, SD-72-SA-0094-1-VOL-1
Contract NAS9-12004

Descriptors: *Earth orbits, *Flight hazards, *Flight safety, *Space shuttle orbiters, Payloads, Rescue operations, Space stations, Spacecraft docking, Survival, Tumbling motion.

For abstract, see STAR 10 21.

N72-30805 PC$21.00/MF$0.95
North American Rockwell Corp., Downey, Calif. Space Div.
SAFETY IN EARTH ORBIT STUDY. VOLUME 2 ANALYSIS OF HAZARDOUS PAYLOADS, DOCKING, ON-BOARD SURVIVABILITY.
Final Report
12 Jul 72, 376p NASA-CR-128508, MSC-04477-VOL-2
Contract NAS9-12004

Descriptors: *Flight hazards, *Payloads, *Space shuttle orbiters, *Spacecraft docking, *Survival, Astronauts, Emergencies, Space stations.

For abstract, see STAR 10 21.

N72-30806 PC$15.50/MF$0.95
North American Rockwell Corp., Downey, Calif. Space Div.
SAFETY IN EARTH ORBIT STUDY. VOLUME 3 ANALYSIS OF TUMBLING SPACECRAFT, ESCAPE AND RESCUE.
Final Report
12 Jul 72, 209p NASA-CR-128509, MSC-04477-VOL-3
Contract NAS9-12004

Descriptors: *Flight hazards, *Rescue operations, *Space shuttle orbiters, *Survival, *Tumbling motion, Astronauts, Command modules, Escape systems, Flight safety, Space stations.

For abstract, see STAR 10 21.

N72-30807 PC$4.25/MF$0.95
North American Rockwell Corp., Downey, Calif. Space Div.
SAFETY IN EARTH ORBIT STUDY. VOLUME 4 SPACE SHUTTLE ORBITER SAFETY REQUIREMENTS AND GUIDELINES ON-ORBIT PHASE.
Final Report
12 Jul 72, 44p NASA-CR-128510, SD-72-SA-0094-4-VOL-4
Contract NAS9-12004

Descriptors: *Flight hazards, *Flight safety, *Space shuttle orbiters, *Spacecraft design, Payloads, Safety devices, Space stations, Warning systems.

For abstract, see STAR 10 21.

N72-30808 PC$5.00/MF$0.95
North American Rockwell Corp., Downey, Calif. Space Div.
SAFETY IN EARTH ORBIT STUDY. VOLUME 5 SPACE SHUTTLE PAYLOADS SAFETY

REQUIREMENTS AND GUIDELINES ON-ORBIT PHASE.
Final Report
12 Jul 72, 58p NASA-CR-128511, SD-72-SA-0094-5-VOL-5
Contract NAS9-12004

Descriptors: *Flight hazards, *Flight safety, *Payloads, *Space shuttle orbiters, *Space stations, Safety devices, Spacecraft design, Warning systems.

For abstract, see STAR 10 21.

N72-30809 PC$11.50/MF$0.95
TRW Systems Group, Houston, Tex. Mission Design Section.
RESULTS OF THE ESP SCHEDULING EFFORT FOR THE SKYLAB 1/2 EXPERIMENTS AND OPERATIONS.
F. W. Knopf. 1 May 70, 186p NASA-CR-128022, TRW-5521.6-31

Descriptors: *Scheduling, *Skylab program, *Spacecrews, Procedures.

For abstract, see STAR 10 21.

N72-30810 PC$5.25/MF$0.95
California Univ., Los Angeles. Space Sciences Center.
MAGNETOMETER INSTRUMENT TEAM STUDIES FOR THE DEFINITION PHASE OF THE OUTER PLANETS GRAND TOUR.
Status Report
P. J. Coleman, Jr. 15 May 72, 64p
NASA-CR-127833
Contract NGR-05-007-327

Descriptors: *Grand tours, *Magnetic fields, *Mission planning, Jupiter (planet), Mariner program, Saturn (planet).

For abstract, see STAR 10 21.

N72-30811 PC$4.50/MF$0.95
Pennsylvania State Univ., University Park.
INVESTIGATION OF TECHNICAL PROBLEMS RELATED TO DEPLOYMENT AND RETRIEVAL OF SPINNING SATELLITES.
Semiannual Progress Report
M. H. Kaplan. Jul 72, 48p NASA-CR-127866, SAPR-5
Contract NGR-39-009-162

Descriptors: *Automatic control, *Deployment, *Spacecraft recovery, Optimization, Satellite attitude control, Transfer orbits.

For abstract, see STAR 10 21.

N72-30817 PC$5.50/MF$0.95
Teledyne Brown Engineering, Huntsville, Ala.
SKYLAB EXPERIMENTAL PERFORMANCE EVALUATION MANUAL. APPENDIX Q EXPERIMENT T-013 CREW/VEHICLE DISTURBANCES (MSFC/LARC).
B. B. Tonetti. 1 Aug 72, 69p
NASA-CR-61386-APP-Q
Contract NAS8-21804

Descriptors: *Intravehicular activity, *Performance, *Skylab program, *Spacecraft motion, Manuals, Orbital workshops.

For abstract, see STAR 10 21.

N72-30826 PC$11.25/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
MISSION REQUIREMENTS SECOND SKYLAB MISSION, SL-3.
1 Feb 72, 185p NASA-TM-X-68740, MSC-I-MRD-001E-VOL-2

Descriptors: *Aap 2 mission, *Mission planning, *Skylab program, Apollo applications program, Erep, Saturn workshops.

For abstract, see STAR 10 21.

N72-30859 PC$7.00/MF$0.95
General Dynamics Corp., San Diego, Calif. Convair Aerospace Div.
A METHOD FOR DETERMINING THE RESPONSE OF SPACE SHUTTLE TO ATMOSPHERIC TURBULENCE. VOLUME 2 COMPUTER PROGRAM DESCRIPTION AND USAGE INSTRUCTIONS.
R. Huntington, and R. Haller. Dec 71, 96p
NASA-CR-123788, GDC-DDE71-002-VOL-2
Contract NAS8-26363

Descriptors: *Atmospheric turbulence, *Computer programs, *Dynamic response, *Space shuttles, Aerodynamic forces, Transfer functions, Vibration mode.

For abstract, see STAR 10 21.

22B. Spacecraft

AD-750 627 PC$3.00/MF$0.95
Royal Aircraft Establishment Farnborough (England)
ORBITAL OPERATIONS AND PRELIMINARY RESULTS FOR THE SATELLITE PROSPERO.
Technical rept.,
V. W. Adams. Jun 72, 90p Rept no. RAE-TR-72088 DRIC-BR-29634

Descriptors: (*Scientific satellites, *Satellite tracking systems), Telemeter systems, Satellite attitude, Orbital trajectories, Attitude control systems, Guided missile ranges, Ground support equipment, Telemetering data.
Identifiers: Prospero satellites, Black Arrow launch vehicles.

The satellite Prospero (1971-93A) was launched from Woomera by the British Black Arrow launcher on 28 October 1971. The report describes operations for the recovery of data from Prospero in orbit and is based largely on the orbital operations plan produced prior to launch. Results from operational control reports are also given. (Author)

AD-750 628 PC$3.00/MF$0.95
Royal Aircraft Establishment Farnborough (England)
SPACE VEHICLES LAUNCHED BETWEEN 1 JANUARY AND 30 JUNE 1972.
Technical memo.,
J. A. Pilkington. 5 Jul 72, 8p Rept no. RAE-TM-Space-182 DRIC-BR-31159

Descriptors: (*Spacecraft, Records), Space capsules, Manned spacecraft, Rockets, Lunar craft, Satellites (Artificial), Orbital trajectories, Indexes, Great Britain.
Identifiers: Solar orbits.

RAE Technical Report 72004 lists all space vehicles launched before 31 December 1971. The memorandum extends the tabulation to 30 June 1972, and gives some amendments to Technical Report 72004. (Author)

AD-750 631 PC$3.00/MF$0.95
Royal Aircraft Establishment Farnborough (England)
TABLE OF EARTH SATELLITES, VOLUME 2, PARTS 1, 2 AND 3: 1969, 1970 AND 1971.
Technical rept.,
J. A. Pilkington, D. G. King-Hele, and H. Hiller. Jul 72, 125p* Rept no. RAE-TR-72127 DRIC-BR-29694
See also Volume 2, Parts 1 and 2, AD-728 584.

Descriptors: (*Satellites (Artificial), Ephemerides), (*Orbital trajectories, Tables), Weight, Launch vehicles (Aerospace), Life expectancy, Spacecraft debris, Apogee, Perigee, Periodic variations, Reports, Great Britain.

All known artificial satellites launched between 1 January 1969 and 31 December 1971 are listed chronologically. Lifetimes, weights, dimensions and orbital details are given for instrumented satellites and their final-stage rockets. Minor fragments are listed without these details. The methods used in compiling the table are described. The report incorporates a large number of improvements made since the original monthly issues of the table, an index, and a list of amendments to Volume 1 (RAE Technical Report 70020), which records satellites launched before January 1969. (Author)

N72-28173 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SMALL-ANGLE STABILITY ANALYSIS OF A LINEAR CONTROL SYSTEM FOR A HIGH POWER COMMUNICATION SATELLITE.
T. A. Omalley. Aug 72, 60p NASA-TM-X-2597, E-6865

Descriptors: *Communication satellites, *Satellite attitude control, *Stability, Antennas, Equations of motion, Solar arrays.

For abstract, see STAR 10 19.

N72-28446 PC$6.75/MF$0.95
Ludwig-maximilians-universitat, Munich (West Germany). Meteorologisches Inst.
STUDIES FOR THE METEOROLOGICAL PART OF A GEOPHYSICAL SATELLITE PAYLOAD.
H. Bolle, and F. Koepp. Apr 72, 95p
BMBW-FB-W-72-12
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Geophysical satellites, *Meteorological instruments, *Radiometers, Infrared scanners, Radiation measuring instruments, Weather forecasting.

For abstract, see STAR 10 19.

N72-28785 PC$5.25/MF$0.95
Bionetics Corp., Hampton, Va.
BIOWASTE RESISTOJET PROPELLANT SYSTEM BIOLOGICAL AND FUNCTIONAL ANALYSIS, TASK 3.
Final Report
Jul 72, 65p NASA-CR-111977
Contract NAS1-10431

Descriptors: *Exhaust systems, *Human wastes, *Plumes, *Resistojet engines, Bioengineering, Dynamic models, Jet thrust, Metabolic wastes, Spacecraft contamination.

For abstract, see STAR 10 19.

N72-28794 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AIRBREATHING ENGINES FOR SPACE SHUTTLE.
A. J. Glassman, W. L. Stewart, and S. M. Nosek. 1972, 27p NASA-TM-X-68098, E-7018
Conf- Proposed for Presentation At Natl. Aerospace Eng. and Manuf. Meeting, San Diego, Calif., 2-5 Oct. 1972 Sponsored By the Soc. of Automotive Engr.

Descriptors: *Air breathing engines, *Engine design, *Mission planning, *Space shuttles, Aerospace engineering, Problem solving, Systems analysis, Weight analysis.

For abstract, see STAR 10 19.

N72-28826 PC$3.00/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
SATELLITES IN THE SERVICE OF GEOGRAPHY.
H. G. Gierloff-emden, and G. Kritikos. Jun 72, 11p
NASA-TT-F-14301
Contract NASW-2038
Tran- Transl. Into English From Weltraumfahrt Raketentechnik, V. 22, Oct. - Nov. 1971 P 165, 166, 168-170

Descriptors: *Clouds (meteorology), *Fires, *Mapping, *Satellite observation, Computers, Digital systems, Europe, Smoke trails.

For abstract, see STAR 10 19.

N72-28870 PC$5.50/MF$0.95
Arizona Univ., Tucson. Engineering Experiment Station.
CONTROL SYSTEM ESTIMATION AND DESIGN FOR AEROSPACE VEHICLES WITH TIME DELAY.
Final Report
G. R. Allgaier, and T. L. Williams. Jun 72, 66p
NASA-CR-127464
Contract NGR-03-002-115

Descriptors: *Flight control, *Spacecraft control, *Spacecraft design, *Systems engineering, Equipment specifications, Numerical analysis, Optimization.

For abstract, see STAR 10 19.

N72-28871 PC$4.00/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
INFLIGHT DYNAMICS TESTING OF THE APOLLO SPACECRAFT.
W. H. Peters, and B. Marchantel. Mar 72, 37p
NASA-TM-X-58089, MSC-06755

Descriptors: *Apollo spacecraft, *Frequency response, Command modules, Dynamic structural analysis, Flight tests, Lunar module, Service modules.

For abstract, see STAR 10 19.

N72-28872 PC$3.00/MF$0.95
Techtran Corp., Glen Burnie, Md.
SATELLITES AT THE HANOVER SHOW AND NEWS OF FRENCH SATELLITES.
P. Langereux. Jun 72, 12p NASA-TT-F-14313
Contract NASW-2037
Tran- Transl. Into English From Air Cosmos (France), No. 432, 22 Apr. 1972 P 9, 19, 26 and 27

Descriptors: *European space programs, *Space probes, *Spacecraft design, Aerodynamic configurations, Cost analysis, Mission planning.

For abstract, see STAR 10 19.

N72-28873 PC$10.50/MF$0.95
Chrysler Corp., New Orleans, La. Space Div.
ABORT STAGING CHARACTERISTICS OF AN EXTERNAL OXYGEN TANK SEPARATING FROM THE SPACE SHUTTLE 040-A ORBITER (.006 SCALE MODEL) AT MACH NUMBERS OF 0.6, 2.0, AND 4.0.
I. Fossler, and P. Cole. Jun 72, 167p
NASA-CR-120041, DMS-DR-1241
Contract NAS8-4016

Descriptors: *Aerodynamic characteristics, *Space shuttle orbiters, *Wind tunnel stability tests, Aerodynamic configurations, External stores, Pressure distribution.

For abstract, see STAR 10 19.

N72-28874 PC$8.00/MF$0.95
Chrysler Corp., New Orleans, La. Space Div.
HEAT TRANSFER TESTS OF THE MCDONNELL-DOUGLAS DELTA WING ORBITER MATED WITH -17A BOOSTER AT MACH NUMBER 8.
R. K. Matthews, W. R. Martindale, and J. D. Warmbrod. May 72, 118p NASA-CR-120067, DMS-DR-1262-VOL-1
Contract NAS8-4016

Descriptors: *Aerodynamic heating, *Delta wings, *Heat transfer, *Space shuttle orbiters, Aerodynamic characteristics, Hypersonic speed, Wind tunnel models.

For abstract, see STAR 10 19.

N72-28875 PC$10.25/MF$0.95
Chrysler Corp., New Orleans, La. Space Div.
HEAT TRANSFER TEST OF THE MCDONNELL-DOUGLAS DELTA WING ORBITER AND THE -17A BOOSTER (NOT MATED) AT MACH NUMBER 8, VOLUME 2.
R. K. Matthews, W. R. Martindale, and J. D. Warmbrod. May 72, 164p NASA-CR-120068, DMS-DR-1262-VOL-2
Contract NAS8-4016

Descriptors: *Aerodynamic heating, *Delta wings, *Heat transfer, *Space shuttle orbiters, Aerodynamic characteristics, Hypersonic speed, Wind tunnel models.

For abstract, see STAR 10 19.

N72-28876 PC$9.50/MF$0.95
Martin Marietta Corp., Denver, Colo.
SYSTEMS-LEVEL STUDY OF A NONSURVIVABLE JUPITER TURBOPAUSE PROBE. VOLUME 3 APPENDIXES.
Final Report, 4 Jun. 1971 - 4 Mar. 1972
R. S. Wiltshire. Jun 72, 147p NASA-CR-122440, MCR-72-91-VOL-3
Contract NAS5-11445

Descriptors: *Jupiter (planet), *Jupiter atmosphere, *Jupiter probes, *Research projects, Equipment specifications, Product development, Systems engineering.

For abstract, see STAR 10 19.

N72-28877 PC$27.00/MF$0.95
Chrysler Corp., New Orleans, La. Space Div.
SPACE SHUTTLE SPACE SHUTTLE ABORT SEPARATION PRESSURE INVESTIGATION. VOLUME 2, PART A ORBITER DATA AT MACH 5.
Wind Tunnel Test Data Report
L. L. Trimmer, D. A. Love, J. M. Rampy, J. P. Decker, and K. L. Blackwell. Jun 72, 500p
NASA-CR-120061, DMS-DR-1174
Contract NAS8-4016

Descriptors: *Aerodynamic configurations, *Pressure distribution, *Space shuttle orbiters, Aerodynamic characteristics, Hypersonic speed, Wind tunnel models.

For abstract, see STAR 10 19.

N72-28878 PC$5.25/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
THE MANAGEMENT APPROACH TO THE NASA SPACE STATION DEFINITION STUDIES AT THE MANNED SPACECRAFT CENTER.
J. C. Heberlig. Jun 72, 61p NASA-TM-X-58090, MSC-06750

Descriptors: *Nasa programs, *Project management, *Space stations, *Systems engineering, Management planning, Personnel subsystems, Technology utilization.

For abstract, see STAR 10 19.

N72-28879 PC$7.75/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DISASTER WARNING SATELLITE STUDY.
Mar 71, 112p NASA-TM-X-68122

Descriptors: *Communication satellites, *Disasters, *Warning systems, Ground based control, Stationary orbits, Storms (meteorology), Voice communication.

For abstract, see STAR 10 19.

N72-28880 PC$7.00/MF$0.95
North American Rockwell Corp., Tulsa, Okla.
HEAT RESISTANT COMPOSITE STRUCTURE FOR SHUTTLE APPLICATIONS (RYTON-B).
21 Jul 72, 96p NASA-CR-115713, TD-72-20
Contract NAS9-12297

Descriptors: *Composite structures, *Resins, *Space shuttles, *Thermal resistance, Filaments, Graphite, Polymerization, Tapes.

For abstract, see STAR 10 19.

N72-28882 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE LIQUID METAL SLIP RING EXPERIMENT FOR THE COMMUNICATIONS TECHNOLOGY SATELLITE.
R. R. Lovell. 1972, 8p NASA-TM-X-68114, E-7056
Conf- Proposed for Presentation At the Natl. Telecommunications Conf., Houston, Tex., 4-6 Dec. 1972 Sponsored By Ieee

Descriptors: *Aerospace environments, *Communication satellites, *Performance, *Ring structures, Electrical resistance, Liquid metals, Sliding contact, Temperature effects.

For abstract, see STAR 10 19.

N72-28883 PC$3.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
SPACE TRANSPORT VEHICLE PURPOSE, REQUIREMENTS AND PROBLEMS.
V. Vasilyev, and L. Leonidov. Jul 72, 7p
NASA-TT-F-14526
Tran- Transl. Into English From Aviats. I Kosmonavt. (Moscow), No. 6, Jul. 1972 P 38-39

Descriptors: *Reusable spacecraft, *Space missions, *Space transportation, *Spacecraft design, Aerodynamic configurations, Propulsion system configurations, Spacecraft performance.

For abstract, see STAR 10 19.

N72-28884 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
WATER LANDING CHARACTERISTICS OF A MODEL OF A WINGED REENTRY VEHICLE.
S. M. Stubbs. Aug 72, 37p NASA-TN-D-6859, L-8228

Descriptors: *Reentry vehicles, *Space shuttles, *Water landing, Horizontal spacecraft landing, Hydraulic test tunnels, Hydrofoils, Spacecraft models.

For abstract, see STAR 10 19.

N72-28885 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
THE USE OF A SYSTEM OF VARIABLE STRUCTURE TO CONTROL THE FLIGHT RANGE OF A SPACECRAFT REENTERING THE EARTHS ATMOSPHERE.
I. S. Ukolov, Y. A. Tyurin, E. I. Mitroshin, and B. N. Petrov. Aug 72, 20p NASA-TT-F-14386
Contract NASW-2035

Tran- Transl. Into English From Trans. of the 20 Intern. Symp. of Ifac for Automatic Control in the Peaceful Use of Outer Space, Vienna, Sep. 1967 Nauka Press (Moscow), 1971 P 471-481

Descriptors: *Atmospheric entry, *Reentry physics, *Spacecraft control, *Spacecraft design, Equipment specifications, Systems analysis, Systems engineering.

For abstract, see STAR 10 19.

N72-28886 PC$17.00/MF$0.95
General Dynamics/Convair, San Diego, Calif.
INVESTIGATION OF SAFE-LIFE FAIL-SAFE CRITERIA FOR THE SPACE SHUTTLE.
18 May 72, 300p NASA-CR-112049
Contract NAS1-6024

Descriptors: *Fail-safe systems, *Space shuttle boosters, *Structural design, Delta wings, Spacecraft components, Structural design criteria, Swept wings.

For abstract, see STAR 10 19.

N72-28889 PC$19.25/MF$0.95
North American Rockwell Corp., Downey, Calif. Space Div.
ESTABLISHMENT OF DESIGN CRITERIA FOR ACCEPTABLE FAILURE MODES AND FAIL SAFE CONSIDERATIONS FOR THE SPACE SHUTTLE STRUCTURAL SYSTEM.
Final Report
R. W. Westrup. 1 Jun 72, 344p NASA-CR-123725, SD-72-SH-0046
Contract NAS8-27269

Descriptors: *Reliability engineering, *Safety factors, *Space shuttles, *Spacecraft design, Crack propagation, Fatigue (materials), Structural analysis.

For abstract, see STAR 10 19.

N72-28895 PC$5.50/MF$0.95
Arizona Univ., Tucson. Engineering Experiment Station.
CONTROL SYSTEM ESTIMATION AND DESIGN FOR AEROSPACE VEHICLES.
Progress Report
R. T. Stefani, T. L. Williams, and S. J. Yakowitz.
May 72, 69p NASA-CR-127456
Contract NGR-03-002-115

Descriptors: *Applications of mathematics, *Estimators, *Parameterization, *Structural analysis, Least squares method, Methodology, Numerical analysis.

For abstract, see STAR 10 19.

N72-28913 PC$7.00/MF$0.95
General Electric Co., Philadelphia, Pa.
LONG LIFE HIGH RELIABILITY THERMAL CONTROL SYSTEMS STUDY DATA HANDBOOK.
T. R. Scollon, Jr., and M. J. Carpitella. Dec 71, 98p
Contract NASA8-26252

Descriptors: *Spacecraft components, *Spacecraft design, *Thermal control coatings, *Thermodynamic properties, Physical properties, Product development, Thermal protection.

For abstract, see STAR 10 19.

N72-28921 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
NONLINEAR LEAST SQUARES - AN AID TO THERMAL PROPERTY DETERMINATION.
D. M. Curry, and S. D. Williams. Jun 72, 18p
NASA-TM-X-58092, MSC-07048

Descriptors: *Ablative materials, *Least squares method, *Thermophysical properties, Nonlinear equations, Space shuttles, Thermal conductivity.

For abstract, see STAR 10 19.

N72-28928 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TECHNIQUES ASSOCIATED WITH THERMAL-VACUUM TESTING OF THE OAO C HEAT PIPES.
J. P. Marshburn. Aug 72, 10p NASA-TN-D-6875, G-1065

Descriptors: *Heat pipes, *Oao 3, *Performance tests, Equipment specifications, Heat transfer, Systems analysis, Thermodynamic properties.

For abstract, see STAR 10 19.

N72-28941 PC$16.50/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
JPL QUARTERLY TECHNICAL REVIEW, VOLUME 2, NO. 1, APRIL 1972.
Apr 72, 289p NASA-CR-127471
Contract NAS7-100

Descriptors: *Mariner spacecraft, *Propulsion system performance, *Spacecraft tracking, *Telemetry, Mariner venus-mercury 1973, Mars (planet), Moon, Rocket propellants, Solar protons, Spacecraft instruments, Steering.

For abstract, see STAR 10 19.

N72-28960 PC$7.25/MF$0.95
Deutsche Gesellschaft Fuer Luft- Und Raumfahrt, Cologne (West Germany).
REPORT ON THE DGLR-SYMPOSIUM PIONEERS OF SPACE FLIGHT . BERICHT UEBER DAS DGLR-SYMPOSIUM PIONIERE DER RAUMFAHRT.
Sep 71, 104p DLR-MITT-71-24
LANG- IN GERMAN ENGLISH SUMMARY

Descriptors: *Aerospace engineering, *Bibliographies, *Conferences, *Histories, *Scientists, Aerospace sciences, Interplanetary spacecraft, Inventions, Liquid rocket propellants, Manned space flight, Solid rocket propellants, Spacecraft design, Spacecraft propulsion.

For abstract, see STAR 10 19.

N72-29489 PC$3.00/MF$0.95
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
PROPOSED SPACE SHUTTLE CARGO HANDLING CRITERIA AT THE OPERATIONAL SITE (PRELIMINARY).
P. E. Beck. 10 Feb 72, 17p NASA-TM-X-68572, KSC-TR-1145

Descriptors: *Materials handling, *Space logistics, *Space shuttles, Orbital space stations, Space maintenance, Space shuttle orbiters, Spacecraft docking.

For abstract, see STAR 10 20.

N72-29588 PC$11.75/MF$0.95
Lockheed Missiles and Space Co., Sunnyvale, Calif.
IMPROVEMENT OF REUSABLE SURFACE INSULATION MATERIAL.
Final Report
1 Mar 72, 194p NASA-CR-115712, LMSC-D266204
Contract NAS9-12137

Descriptors: *Space shuttles, *Spacecraft construction materials, *Thermal insulation, Mechanical properties, Protective coatings, Rigid structures, Thermophysical properties.

For abstract, see STAR 10 20.

N72-29861 PC$8.50/MF$0.95
Prc Systems Sciences Co., Los Angeles, Calif.
USE OF THE SPACE SHUTTLE TO AVOID SPACECRAFT ANOMALIES.
3 May 72, 127p NASA-CR-127753, PRC-R-1467
Contract NASW-2282

Descriptors: *Failure analysis, *Space shuttles, *Spacecraft design, *Spacecraft performance, Failure analysis, Reliability engineering, Statistical analysis.

For abstract, see STAR 10 20.

N72-29862 PC$15.00/MF$0.95
International Business Machines Corp., Huntsville, Ala. Federal Systems Div.
SPACE STATION DATA FLOW.
19 Jun 72, 256p NASA-CR-123760, IBM-72W-00213
Contract NAS8-26798

Descriptors: *Data links, *Data systems, *Experimentation, *Orbital space stations, Communication satellites, Cost effectiveness, Data processing, Information dissemination, Nasa programs, Orbital workshops, Relay satellites, Space shuttles.

For abstract, see STAR 10 20.

N72-29863 PC$6.25/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
APOLLO 16 THIRTY DAY FAILURE AND ANOMALY LISTING REPORT.
May 72, 82p NASA-TM-X-68561, MSC-07007

Descriptors: *Apollo 16 flight, *Failure analysis, *Malfunctions, *System failures, Postflight analysis, Spacecraft components, Spacecraft configurations.

For abstract, see STAR 10 20.

N72-29864 PC$7.00/MF$0.95
Chrysler Corp., New Orleans, La. Space Div.
ASCENT HEAT TRANSFER RATE DISTRIBUTION ON THE NORTH AMERICAN ROCKWELL DELTA WING ORBITER AND THE GENERAL DYNAMICS/CONVAIR BOOSTER AT A MACH NUMBER OF 8 (MATED).
R. K. Matthews, W. R. Martindale, and J. D. Warmbrod. Jun 72, 99p NASA-CR-120049, DMS-DR-1264-VOL-1
Contract NAS8-4016

Descriptors: *Aerothermodynamics, *Space shuttle orbiters, *Spacecraft configurations, *Wind tunnel models, Aerodynamic characteristics, Booster rocket engines, Heat transfer coefficients, Hypersonic speed.

For abstract, see STAR 10 20.

N72-29865 PC$9.25/MF$0.95
Chrysler Corp., New Orleans, La. Space Div.
ASCENT HEAT TRANSFER RATE DISTRIBUTION ON THE NORTH AMERICAN ROCKWELL DELTA WING ORBITER AND THE GENERAL DYNAMICS/CONVAIR BOOSTER AT A MACH NUMBER OF 8 (NOT MATED).
R. K. Matthews, W. R. Martindale, and J. D. Warmbrod. Jun 72, 142p NASA-CR-120071, DMS-DR-1264-VOL-2
Contract NAS8-4016

Descriptors: *Aerothermodynamics, *Space shuttle boosters, *Space shuttle orbiters, *Spacecraft configurations, *Wind tunnel models, Aerodynamic characteristics, Booster rocket engines, Heat transfer coefficients, Hypersonic speed.

For abstract, see STAR 10 20.

N72-29866 PC$4.25/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SCAN POINTING CALIBRATION FOR THE MARINER MARS 1971 SPACECRAFT.
W. F. Havens, G. I. Jaivin, G. D. Pace, and R. A. Virzi. 1 Aug 72, 43p NASA-CR-127757, JPL-TM-33-556
Contract NAS7-100

Descriptors: *Calibrating, *Mariner 9 space probe, *Mars 71 project, Mars (planet), Pointing control systems, Television cameras.

For abstract, see STAR 10 20.

N72-29867 PC$17.25/MF$0.95
Boeing Co., Seattle, Wash. Research and Engineering Div.
A THERMAL SCALE MODELING STUDY FOR APOLLO AND APOLLO APPLICATIONS, VOLUME I.
Final Report
R. L. Shannon. Jun 72, 302p NASA-CR-115752, D180-15048-1-VOL-1
Contract NAS9-8332

Descriptors: *Apollo applications program, *Apollo spacecraft, *Scale models, *Thermal simulation, Heat transfer, Spacecraft cabins, Thermal environments.

For abstract, see STAR 10 20.

N72-29868 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
A SYSTEM FOR EXAMINING AN AUTOMATICALLY CHECKING THE DYNAMIC CHARACTERISTICS OF THE AUTOMATIC STABILIZATION DEVICE OF A BOOSTER AND SPACE VEHICLE.
A. T. Goryachenkov. Aug 72, 14p NASA-TT-F-14381
Contract NASW-2035
Tran- Transl. Into English From the Publ. Upravleniye Kosmicheskimi Apparatami I Korablyami Yami Moscow, Nauka, 1971 P 29-36

Descriptors: *Control equipment, *Flight control, *Spacecraft control, Aerodynamic configurations, Systems analysis, Systems engineering.

For abstract, see STAR 10 20.

N72-29869 PC$3.25/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
GAS-DYNAMIC BANK CONTROL OF A SPACECRAFT IN THE ATMOSPHERE.
R. V. Studnev. Aug 72, 24p NASA-TT-F-14387
Contract NASW-2035
Tran- Transl. Into English From the Book Upravleniye Kosmicheskimi Apparatami I Korablyami Moscow, Nauka Press 1971 P 482-496

Descriptors: *Atmospheric entry, *Attitude control, *Optimal control, *Spacecraft control, Aerodynamic forces, Angle of attack, Reentry vehicles, Spacecraft stability.

For abstract, see STAR 10 20.

N72-29870 PC$3.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
EFFECTS OF STRUCTURAL FLEXIBILITY ON ENTRY VEHICLE CONTROL SYSTEMS.
Space Vehicle Design Criteria (Guidance and Control)
Jun 72, 68p NASA-SP-8098

Descriptors: *Atmospheric entry, *Flexibility, *Reentry vehicles, *Spacecraft control, Control equipment, Systems engineering.

For abstract, see STAR 10 20.

N72-29871 PC$3.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
S-CUBED-A SPACECRAFT AND EXPERIMENT DESCRIPTION.
G. W. Longanecker, and R. A. Hoffman. Jul 72, 21p NASA-TM-X-65973, X-646-72-240
Subm- Submitted for Publication

Descriptors: *Explorer satellites, *Magnetosphere, *Mission planning, *Space missions, Equipment specifications, Spacecraft launching, Systems engineering.

For abstract, see STAR 10 20.

N72-29872 PC$4.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PREDICTIONS OF VEHICLE ENCOUNTERED ELECTRON AND PROTON FLUXES FOR THE UK-4 SPACECRAFT.
E. G. Stassinopoulos. Mar 72, 37p NASA-TM-X-65969, X-601-72-131

Descriptors: *Extraterrestrial radiation, *Radiation measurement, *Uk 4 satellite, Data acquisition, Electrons, Elementary particles, Flux density, Protons.

For abstract, see STAR 10 20.

N72-29873 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
IMP-I SPACECRAFT FINAL MAGNETIC TESTS.
Final Report
C. A. Harris. Feb 72, 20p NASA-TM-X-65972, X-325-72-183

Descriptors: *Demagnetization, *Explorer 43 satellite, *Magnetic fields, Equipment specifications, Prelaunch tests, Satellite instruments.

For abstract, see STAR 10 20.

N72-29875 PC$35.85/MF$0.95
Chrysler Corp., New Orleans, La. Space Div.
SPACE SHUTTLE AERODYNAMIC CHARACTERISTICS OF A DOUBLE DELTA WING SPACE SHUTTLE ORBITER (M EQUALS 0.6 - 5.0).
R. R. Ellis, and M. Gamble. Aug 72, 617p NASA-CR-120057, DMS-DR-1254
Contract NAS8-4016

Descriptors: *Delta wings, *Scale models, *Space shuttle orbiters, *Wind tunnel stability tests, Aerodynamic characteristics, Supersonic wind tunnels.

For abstract, see STAR 10 20.

N72-29876 PC$54.50/MF$0.95
Chrysler Corp., New Orleans, La. Space Div.
STATIC STABILITY AND CONTROL EFFECTIVENESS OF A PARAMETRIC LAUNCH VEHICLE.
R. R. Ellis, and M. Gamble. Jul 72, 1048p NASA-CR-120059, DMS-DR-1256
Contract NAS8-4016

Descriptors: *Aerodynamic stability, *Launch vehicle configurations, *Space shuttles, Aerodynamic configurations, Angle of attack, Control stability, Control surfaces, Static stability, Wind tunnel stability tests.

For abstract, see STAR 10 20.

N72-29877 PC$27.75/MF$0.95
Chrysler Corp., New Orleans, La. Space Div.
STATIC AERODYNAMIC CHARACTERISTICS OF THE S-IC BOOSTER/GAC H-33 ORBITER LAUNCH VEHICLE CONFIGURATION.
J. F. Sims, and R. W. Ainsworth. Jul 72, 512p NASA-CR-120016, DMS-DR-1187
Contract NAS8-4016

Descriptors: *Aerodynamic characteristics, *Launch vehicle configurations, *Space shuttle orbiters, *Wind tunnel stability tests, Body-wing configurations, Booster rocket engines, Fuel tanks, Scale models, Transonic wind tunnels.

For abstract, see STAR 10 20.

N72-29878 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SKYLAB PAYLOAD SHROUD JETTISON TESTS.
C. J. Daye. Aug 72, 40p NASA-TN-D-6913, E-6779

Descriptors: *Payloads, *Shrouds, *Skylab program, *Spacecraft design, Data acquisition, Performance tests, Systems engineering.

For abstract, see STAR 10 20.

N72-29879 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
THE CONSTRUCTION OF CONTROL SYSTEMS FOR BOOSTER ROCKETS AND SPACECRAFT WHICH PERFORM HIGH SPEED MOTIONS AROUND THE CENTER OF MASS.
A. S. Kachanov. Aug 72, 17p NASA-TT-F-14380
Contract NASW-2035
Tran- Transl. Into English From the Book Upravleniye Kosmicheskimi Apparatami I Korablyami Nauka Press, Moscow P 19-28

Descriptors: *Control equipment, *Missile control, *Rocket flight, Electronic equipment, Product development, Systems analysis, Systems engineering.

For abstract, see STAR 10 20.

N72-29995 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
SUPERSONIC AERODYNAMIC CHARACTERISTICS OF A TWO-STAGED SPACE-SHUTTLE MODEL HAVING A DELTA-WING ORBITER MATED ATOP A WINGED BOOSTER.
E. B. Graves. Sep 72, 260p NASA-TM-X-2569, L-8300

Descriptors: *Aerodynamic characteristics, *Delta wings, *Space shuttles, *Supersonic speeds, *Wind tunnel models, Aerodynamic configurations, Spacecraft performance, Stability derivatives.

For abstract, see STAR 10 21.

N72-30216 PC$4.50/MF$0.95
Bell Aerospace Co., Buffalo, N.Y.
SHUTTLE FREE-FLYING TELEOPERATOR SYSTEM EXPERIMENT DEFINITION. VOLUME 1 EXECUTIVE SUMMARY.
Final Report
Jun 72, 46p NASA-CR-123793, DPD-261-DR-MA04-VOL-1

Contract NAS8-27895

Descriptors: *Space shuttles, *Teleoperators, Mission planning, Systems engineering.

For abstract, see STAR 10 21.

N72-30217 PC$6.75/MF$0.95
Bell Aerospace Co., Buffalo, N.Y.
SHUTTLE FREE-FLYING TELEOPERATOR SYSTEM EXPERIMENT DEFINITION. VOLUME 3 PROGRAM DEVELOPMENT REQUIREMENTS.
Final Report
Jun 72, 91p NASA-CR-123792, DPD-261-DR-MA04-VOL-3
Contract NAS8-27895

Descriptors: *Mission planning, *Space shuttles, *Teleoperators, Systems engineering.

For abstract, see STAR 10 21.

N72-30621 PC$3.75/MF$0.95
Houston Univ., Tex.
SUPPORTING STUDIES FOR THE CORONAGRAPH CONTAMINATION EXPERIMENT.
Final Report, 1 Sep. 1968 - 28 Feb. 1971
N. S. Kovar. 28 Feb 71, 35p NASA-CR-115762
Contract NAS9-8869

Descriptors: *Air pollution, *Coronagraphs, *Light scattering, *Particle size distribution, *Spacecraft contamination, Aerospace environments, Experimentation, Instrument errors, Manned spacecraft, Mie scattering.

For abstract, see STAR 10 21.

N72-30813 PC$11.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SSS-A ATTITUDE CONTROL PRELAUNCH ANALYSIS AND OPERATIONS PLAN.
R. D. Werking, J. Beck, D. Gardner, P. Moyer, and M. Plett. Oct 71, 180p NASA-TM-X-65988, X-542-71-416

Descriptors: *Computer programs, *Mission planning, *Satellite attitude control, *Small scientific satellites, Preflight analysis.

For abstract, see STAR 10 21.

N72-30829 PC$22.50/MF$0.95
Hughes Aircraft Co., Los Angeles, Calif. Space and Communications Group.
APPLICATIONS TECHNOLOGY SATELLITES ADVANCED MISSION STUDY.
Final Report
L. M. Gould. Jul 72, 406p NASA-CR-120872
Contract NAS3-14359

Descriptors: *Applications technology satellites, *Communication satellites, *Spacecraft configurations, *Synchronous satellites, Electric propulsion, Launch vehicles, Transfer orbits.

For abstract, see STAR 10 21.

N72-30854 PC$7.25/MF$0.95
Applied Dynamics Research Corp., Huntsville, Ala.
DESIGN, DEVELOP, FABRICATE, ASSEMBLE AND CHECKOUT AND ADVANCED ACTIVE DAMPER SYSTEM.
Final Report, 18 Nov. 1970 - 31 Mar. 1971
C. S. Chang. 31 Mar 72, 105p NASA-CR-127815, T-1008F
Contract NAS8-26593

Descriptors: *Electromagnetism, *Loads (forces), *Saturn 1b launch vehicles, *Vibration isolators, Aeroelasticity, Calibrating, Checkout, Ground wind, Wind tunnel models.

For abstract, see STAR 10 21.

N72-30855 PC$7.52/MF$0.95
Mcdonnell-douglas Astronautics Co., Huntington Beach, Calif.
SIMULATION OF A FLEXIBLE SPINNING VEHICLE.
Final Report
W. A. Baudry. Jul 72, 104p NASA-CR-123789, MDC-G2968
Contract NAS8-26700

Descriptors: *Artificial gravity, *Flexible bodies, *Rotating bodies, *Simulation, *Space stations, Control equipment, Gyroscopes, Remote control.

For abstract, see STAR 10 21.

N72-30856 PC$3.50/MF$0.95
Technology, Inc., Dayton, Ohio. Information Systems Div.
APPLICATION OF THE QSDC PROCEDURE TO THE FORMULATION OF SPACE SHUTTLE DESIGN CRITERIA. VOLUME 1 STUDY EFFORT.
Final Report, 13 Apr. 1971 - 31 Mar. 1972
I. Bouton, and G. L. Martin. Jun 72, 30p
NASA-CR-123787, TI-425-72-14-VOL-1
Contract NAS8-26918

Descriptors: *Probability theory, *Spacecraft structures, *Structural engineering, *Structural failure, Numerical analysis, Reliability engineering, Systems analysis.

For abstract, see STAR 10 21.

N72-30857 PC$7.75/MF$0.95
Technology, Inc., Dayton, Ohio. Informations Systems Div.
APPLICATION OF THE QSDC PROCEDURE TO THE FORMULATION OF SPACE SHUTTLE DESIGN CRITERIA. VOLUME 2 APPLICATIONS GUIDE.
Final Report, 13apr. 1971 - 13 Mar. 1972
I. Bouton, and G. L. Martin. Jun 72, 113p
NASA-CR-123786, TI-425-72-14-VOL-2
Contract NAS8-26918

Descriptors: *Probability theory, *Space shuttles, *Spacecraft structures, *Structural engineering, *Structural failure, Numerical analysis, Reliability engineering, Systems analysis.

For abstract, see STAR 10 21.

N72-30858 PC$34.00/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
COMMAND MODULE/SERVICE MODULE REACTION CONTROL SUBSYSTEM ASSESSMENT.
D. P. Weary. Jun 71, 638p NASA-TM-X-68578, MSC-03432

Descriptors: *Apollo project, *Command service modules, *Reaction control, Checkout, Failure analysis, Ground support equipment.

For abstract, see STAR 10 21.

N72-30860 PC$7.50/MF$0.95
Southwest Research Inst., San Antonio, Tex.
SYNTHESIS OF SHUTTLE VEHICLE DAMPING USING SUBSTRUCTURE TEST RESULTS.
Interim Report
D. D. Kana, and S. Huzar. Jun 72, 108p
NASA-CR-123791
Contracts NAS8-27569, SWRI PROJ. 02-3131

Descriptors: *Damping tests, *Performance prediction, *Space shuttles, *Spacecraft structures, Dynamic response, Eigenvalues, Resonant frequencies.

For abstract, see STAR 10 21.

N72-30861 PC$16.50/MF$0.95
General Dynamics Corp., San Diego, Calif. Convair Aerospace Div.
RESEARCH AND APPLICATIONS MODULES (RAM), PHASE B STUDY.
12 May 72, 287p NASA-CR-123785, DPD-239
Contract NAS8-27539

Descriptors: *Mission planning, *Space missions, *Spacecraft modules, *Test facilities, Equipment specifications, Product development, Research and development.

For abstract, see STAR 10 21.

N72-30862 PC$8.50/MF$0.95
Rensselaer Polytechnic Inst., Troy, N.Y. School of Engineering.
ANALYSIS AND DESIGN OF A CAPSULE LANDING SYSTEM AND SURFACE VEHICLE CONTROL SYSTEM FOR MARS EXPORATION.
Progress Report, 1 Jul. 1971 - 30 Jun. 1972
D. K. Frederick, P. K. Lashmet, G. N. Sandor, C. N. Shen, and E. J. Smith. 30 Jun 72, 130p
NASA-CR-127862, RPI-TR-MP-28
Contract NGL-33-018-091

Descriptors: *Mars (planet), *Remote control, *Roving vehicles, *Space exploration, Automatic control, Optimization, Systems analysis, Systems engineering.

For abstract, see STAR 10 21.

N72-30863 PC$11.25/MF$0.95
Honeywell, Inc., Minneapolis, Minn. Government and Aeronautical Products Div.
AIR DATA MEASUREMENT SYSTEM FOR SPACE SHUTTLE.
Interim Report
J. C. Dejesus, D. J. Sowada, and F. A. Moynihan. 27 Jul 72, 182p NASA-CR-123812
Contract NAS8-26326

Descriptors: *Remote sensors, *Space shuttles, Angle of attack, Meteorological parameters, Sideslip.

For abstract, see STAR 10 21.

N72-30865 PC$9.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
NASA SPACE SHUTTLE TECHNOLOGY CONFERENCE DYNAMICS AND AEROELASTICITY STRUCTURES AND MATERIALS.
Progress Report
Jul 72, 785p NASA-TM-X-2570, L-8393
Conf- Conf. Held in San Antonio, 12-14 Apr. 1972 in Conjunction With the Aiaa/Asme/Sae 13th Struct., Structural Dyn. and Mater. Conf.

Descriptors: *Aerodynamic stability, *Aeroelasticity, *Conferences, *Construction materials, *Dynamic structural analysis, *Space shuttles, *Structural design criteria, *Thermal protection, Aerodynamic noise, Heat shielding, Spacecraft components, Spacecraft structures, Structural stability, Vibration damping, Wind tunnel stability tests.

For abstract, see STAR 10 21.

N72-30889 PC$7.00/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
NASA/DOD EARTH ORBIT SHUTTLE TRAFFIC MODELS BASED ON END TO END LOADING OF PAYLOADS.
R. E. Kincade, M. E. Donahoo, and W. R. Pruett. 8 Jul 71, 97p NASA-TM-X-68573, MSC-04491

Descriptors: *Mission planning, *Payloads, *Space missions, *Space shuttles, Space tugs, Spacecraft design, Spacecraft propulsion.

For abstract, see STAR 10 21.

N72-30890 PC$6.25/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
NASA/DOD EARTH ORBIT SHUTTLE TRAFFIC MODELS BASED ON SIDE BY SIDE LOADING OF PAYLOADS.
R. E. Kincade, M. E. Donahoo, and W. R. Pruett. 8 Jul 71, 85p NASA-TM-X-68574, MSC-04492

Descriptors: *Mission planning, *Payloads, *Space missions, *Space shuttles, Space tugs, Spacecraft design, Spacecraft propulsion.

For abstract, see STAR 10 21.

N72-30891 PC$5.25/MF$0.95
Keuffel and Esser Co., Morristown, N.J.
FABRICATION AND EVALUATION OF A WEAK ZONE PLATE FOR MONITORING PERFORMANCE OF LARGE ORBITING TELESCOPES.
Final Report
K. E. Erickson. 15 Jul 72, 61p NASA-CR-112080
Contract NAS1-10564

Descriptors: *Astronomical telescopes, *Holography, *Mirrors, Magnitude, Optical measurement, Wavelengths.

For abstract, see STAR 10 21.

N72-30894 PC$6.00/MF$0.95
Mcdonnell-douglas Astronautics Co., St. Louis, Mo.
ANALYTICAL DETERMINATION OF THE EFFECT OF STRUCTURAL ELASTICITY ON LANDING STABILITY OF A VERSION OF THE VIKING LANDER.
R. M. Laurenson. Aug 72, 77p NASA-CR-112115
Contract NAS1-8137

Descriptors: *Spacecraft configurations, *Spacecraft landing, *Viking lander spacecraft, analytical determination of the effect of structural elasticity on landing stability of a version of the viking lander..

For abstract, see STAR 10 21.

N72-30897 PC$14.25/MF$0.95
Boeing Co., Seattle, Wash. Research and Engineering Div.
A THERMAL SCALE MODELING STUDY FOR APOLLO AND APOLLO APPLICATIONS, VOLUME 2.
Final Report
R. L. Shannon. Jun 72, 241p NASA-CR-115753, D180-15048-1-VOL-2
Contract NAS9-8332

Descriptors: *Apollo spacecraft, *Environmental control, *Environmental engineering, *Heat transfer, *Scale models, Materials tests, Nusselt number, Thermal insulation, Thermodynamic properties.

For abstract, see STAR 10 21.

N72-30900 PC$24.25/MF$0.95
Ball Bros. Research Corp., Boulder, Colo.
OSO-6 ORBITING SOLAR OBSERVATORY.
Final Report
12 Jan 72, 422p NASA-CR-122451, F70-03
Contract NAS5-9300

Descriptors: *Orbital mechanics, *Oso, *Satellite design, *Satellite orbits, *Space probes, Data acquisition, Satellite observation, Solar sensors.

For abstract, see STAR 10 21.

N72-30901 PC$19.50/MF$0.95
Wyle Labs., Inc., Huntsville, Ala.
EVALUATION OF ACOUSTIC TESTING TECHNIQUES FOR SPACECRAFT SYSTEMS.
Final Report, Mar. 1970 - Feb. 1971
J. A. Cockburn. Jun 71, 348p NASA-CR-122450, WR-71-7
Contract NAS5-21203

Descriptors: *Acoustic measurements, *Acoustic properties, *Noise intensity, *Spacecraft configurations, Sound pressure, Sound propagation, Sound waves.

For abstract, see STAR 10 21.

N72-30902 PC$21.25/MF$0.95
Grumman Aerospace Corp., Bethpage, N.Y.
SPACE SHUTTLE ORBITER HEAT PIPE APPLICATIONS. VOLUME 2 FINAL REPORT.
Final Report
J. P. Alario, and R. C. Prager. Apr 72, 381p NASA-CR-128498, SPR-14-VOL-2
Contract NAS9-12034

Descriptors: *Heat pipes, *Heat transfer, *Space shuttle orbiters, *Temperature control, Performance tests, Prototypes, Systems engineering.

For abstract, see STAR 10 21.

N72-30905 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Manned Spacecraft Center, Houston, Tex.
APOLLO EXPERIENCE REPORT LUNAR MODULE COMMUNICATIONS SYSTEM.
R. H. Dietz, D. E. Rhoades, and L. J. Davidson. Sep 72, 69p NASA-TN-D-6974, MSC-S-324

Descriptors: *Apollo project, *Lunar module, *Spacecraft communication, Command service modules, Manned space flight network, Rangefinding, Telemetry, Television systems, Voice communication.

For abstract, see STAR 10 21.

N72-30906 PC$3.25/MF$0.95
Mcdonnell-douglas Astronautics Co., St. Louis, Mo.
REFURBISHMENT COST STUDY OF THE THERMAL PROTECTION SYSTEM OF A SPACE SHUTTLE VEHICLE, PHASE 2.
D. W. Haas. 1972, 24p NASA-CR-112123
Contract NAS1-10990

Descriptors: *Costs, *Labor, *Reusable spacecraft, *Space shuttles, *Thermal protection, Cost effectiveness, Heat shielding, Maintainability, Space shuttle orbiters.

For abstract, see STAR 10 21.

N72-30907 PC$6.50/MF$0.95
Grumman Aerospace Corp., Bethpage, N.Y.
SPACE SHUTTLE ORBITER HEAT PIPE APPLICATIONS. VOLUME 1 SYNOPSIS.
Final Report, 6 Jul. 1971 - 30 Apr. 1972
J. P. Alario, and R. C. Prager. Apr 72, 88p NASA-CR-128497, SPR-14-VOL-1
Contract NAS9-12034

Descriptors: *Heat pipes, *Heat transfer, *Space shuttle orbiters, *Temperature control, Performance tests, Prototypes, Systems engineering.

For abstract, see STAR 10 21.

N72-30908 PC$20.00/MF$0.95
Chrysler Corp., New Orleans, La. Space Div.
SPACE SHUTTLE HEAT TRANSFER RATE DISTRIBUTIONS ON MCDONNELL-DOUGLAS DELTA WING ORBITER DETERMINED BY PHASE-CHANGE PAINT TECHNIQUE FOR NOMINAL MACH NUMBER OF 8.
R. K. Matthews, W. R. Martindale, and J. D. Warmbrod. Jul 72, 358p NASA-CR-120025, DMS-DR-1207-VOL-1-REV
Contract NAS8-4016
Misc Orevised

Descriptors: *Aerodynamic heat transfer, *Delta wings, *Space shuttle orbiters, Atmospheric entry simulation, Hypervelocity wind tunnels, Phase transformations, Spacecraft models.

For abstract, see STAR 10 21.

N72-30925 PC$4.50/MF$0.95
Office National Detudes Et de Recherches Aerospatiales, Paris (France).
COMPUTATION OF THE VIBRATIONAL CHARACTERISTICS OF A SATELLITE STRUCTURE . CALCUL DES CARACTERISTIQUES VIBRATOIRES DUNE STRUCTURE DE SATELLITE.
M.S. Thesis - Paris Univ.
D. Engrand. 1972, 48p ONERA-NT-188
LANG- IN FRENCH ENGLISH SUMMARY

Descriptors: *Prediction analysis techniques, *Spacecraft structures, *Structural vibration, *Vibration mode, Dynamic structural analysis, Finite difference theory, Pogo effects, Ritz averaging method, Satellite configurations, Structural reliability.

For abstract, see STAR 10 21.

N72-30947 PC$10.50/MF$0.95
Martin Marietta Corp., Denver, Colo. Manufacturing Engineering Dept.
BERYLLIUM HEAT SHIELD TECHNOLOGY IN THE AREA OF THERMAL PROTECTION DEVICES.
Final Report
A. E. Muhl, and E. J. Rupert. Jun 72, 166p NASA-CR-123756, MCR-72-158
Contract NAS8-27016

Descriptors: *Beryllium, *Heat shielding, *Space shuttles, *Thermal protection, Brazing, Hot working, Panels, Titanium alloys.

For abstract, see STAR 10 21.

N72-30948 PC$18.25/MF$0.95
General Dynamics/Convair, San Diego, Calif. Aerospace Div.
EVALUATION OF COATED COLUMBIAN ALLOY HEAT SHIELDS FOR SPACE SHUTTLE THERMAL PROTECTION SYSTEM APPLICATION. VOLUME 1 PHASE 1 - ENVIRONMENTAL CRITERIA AND MATERIAL CHARACTERIZATION, OCTOBER 1970 - MARCH 1972.
W. E. Black. Jun 72, 325p NASA-CR-112119
Contract NAS1-9793

Descriptors: *Heat shielding, *Niobium alloys, *Silicon, *Space shuttles, *Thermal control coatings, Space environment simulation, Spacecraft shielding, Thermal insulation.

For abstract, see STAR 10 21.

N72-30950 PC$5.00/MF$0.95
Teledyne Brown Engineering, Huntsville, Ala.
SKYLAB EXPERIMENT PERFORMANCE EVALUATION MANUAL. APPENDIX B EXPERIMENT M-415, THERMAL CONTROL COATINGS (MSFC).
K. S. Purushotham. Aug 72, 60p
NASA-CR-61386-APP-B, REPT-5161-APP-B
Contract NAS8-21804

Descriptors: *Skylab program, *Thermal control coatings, *Thermal protection, Failure analysis, Materials tests, Thermodynamic properties.

For abstract, see STAR 10 21.

N72-30951 PC$8.00/MF$0.95
General Electric Co., Philadelphia, Pa. Reentry and Environmental Systems Div.

EXPLORATORY DEVELOPMENT OF A FLEXIBLE ABLATIVE COVERING FOR SPACE SHUTTLE APPLICATION.
Final Report
A. A. Hiltz. Jun 72, 119p NASA-CR-128302
Contract NAS9-12067

Descriptors: *Ablative materials, *Space shuttles, Elastomers, Fabrics.

For abstract, see STAR 10 21.

22C. Spacecraft Trajectories and Reentry

AD-750 520 PC$3.00/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
SPACECRAFT CONTROL OVER A SEGMENT OF THE ATMOSPHERIC REENTRY TRAJECTORY USING ON-BOARD COMPUTERS.
I. S. Ukolov, E. I. Mitrokhin, V. E. Kraizman, and L. G. Oleinichenko. 12 Jul 72, 14p Rept no. FTD-HC-23-1137-72
Unedited rough draft trans. of Aviatsionnyi Institut, Moscow. Trudy (USSR) n7 p52-60 1970.

Descriptors: (*Navigation computers, *Descent trajectories), (*Spacecraft, *Atmosphere entry), Optimization, Space navigation, Automatic navigators, Control systems, Mathematical models, Boundary value problems, USSR.
Identifiers: Translations, Feedback control, Control theory.

The report presents 2 descriptions of a computerized automatic control system for the trajectory of a spacecraft in the first stage of reentry at speeds greater than 7 m per sec, i.e., the stage in which the spacecraft is deflected beyond the atmosphere. The primary purpose of the control system is to bring the spacecraft to a secondary reentry that is a given distance away from the initial reentry point, regardless of the large set of possible initial conditions and acting disturbances. To reduce the volume of prelaunch data storage, the proposed system combines computational prediction of the paramaters of motion with the principles of closed loop feedback. (Author)

AD-750 793 PC$3.00/MF$0.95
Bell Aerospace Co Buffalo N Y
RAIN EROSION CHARACTERISTICS OF THERMAL PROTECTION SYSTEM MATERIALS AT SUBSONIC VELOCITIES.
Summary technical rept. 3 Apr-30 Jun 72,
Norman E. Wahl. Aug 72, 118p AFML-TR-72-145
Contract F33615-71-C-1219

Descriptors: (*Heat shields, Rain), (*Rendezvous spacecraft, *Heat shields), Erosion, Subsonic characteristics, Intensity, Angle of attack, Composite materials, Test methods.
Identifiers: *Rain erosion, *Space shuttles, Ablators.

The relative rain erosion resistance of low density-thermal protection materials for the space shuttle were evaluated at velocities of 200, 350 and 410 miles per hour, angles of attack of 10, 20, 40 and 90 degrees and rainfall intensities of 1/4, 1/2 and 1 inch per hour on the AFML-Bell rotating arm rain erosion test apparatus. (Author)

N72-28663 PC$3.50/MF$0.95
Boeing Co., Houston, Tex.
G AND C BOOST AND ABORT STUDY SUMMARY, EXHIBIT B.
H. D. Backman. 30 Jun 72, 28p NASA-CR-115714, REPT-5-2581-HOU-093
Contract NAS9-12183

Descriptors: *Abort trajectories, *Computer programs, *Space shuttles, *Trajectory analysis, Digital computers, Numerical analysis, Simulation.

For abstract, see STAR 10 19.

N72-28669 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
A SYSTEM FOR CONTROLLING THE THREE DIMENSIONAL MOTION OF A SPACECRAFT DURING ITS ATMOSPHERE ENTRY.
V. S. Vedrov, G. P. Vladychin, and I. A. Rubtsova. Aug 72, 12p NASA-TT-F-14385
Contract NASW-2035
Tran- Transl. Into English From Proc. of 2d Intern. Symp. of Ifac for Autom. Control in the Peaceful Use of Outer Space, Vienna, Sep. 1967

Descriptors: *Atmospheric entry, *Reentry physics, *Spacecraft control, Aerodynamic characteristics, Numerical analysis, Systems analysis, Systems engineering.

For abstract, see STAR 10 19.

N72-28831 PC$13.00/MF$0.95
System Development Corp., Santa Monica, Calif.
THE APPLICATION OF GENERALIZED, CYCLIC, AND MODIFIED NUMERICAL INTEGRATION ALGORITHMS TO PROBLEMS OF SATELLITE ORBIT COMPUTATION.
L. Chesler, and S. Pierce. 15 Mar 71, 216p
NASA-CR-122442, SDC-TM-4717
Contract NAS5-11875

Descriptors: *Algorithms, *Differential equations, *Equations of motion, *Numerical integration, *Orbit calculation, Computer programs, Evaluation, Runge-kutta method, Satellite orbits.

For abstract, see STAR 10 19.

N72-28835 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SPACE SHUTTLE EARTH ORBITAL RENDEZVOUS TARGETING TECHNIQUES FOR NEAR CIRCULAR TARGET SATELLITE ORBITS.
A. W. Deaton. 27 Jun 72, 27p NASA-TM-X-64675

Descriptors: *Space shuttles, *Target acquisition, Orbital rendezvous.

For abstract, see STAR 10 19.

N72-28836 PC$11.75/MF$0.95
Boeing Co., Houston, Tex.
USERS GUIDE FOR GUIDANCE AND CONTROL LAUNCH AND ABORT SIMULATION FOR SPACECRAFT (LASS), VOLUME 1.
T. F. Havig, and H. D. Backman. 30 Jun 72, 191p
NASA-CR-115716, D2-118387-1A
Contract NAS9-12183

Descriptors: *Aborted missions, *Computerized simulation, *Manuals, *Mathematical models, *Spacecraft launching, Computer programs, Spacecraft control, Spacecraft guidance.

For abstract, see STAR 10 19.

N72-28850 PC$4.75/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SENSOR LIGHTING CONSIDERATIONS FOR EARTH OBSERVATORY SATELLITE MISSIONS.
J. L. Cooley. Jun 72, 52p NASA-TM-X-65955, X-551-72-202
Subm- Submitted for Publication

Descriptors: *Earth satellites, *Illuminating, *Onboard equipment, Periodic variations.

For abstract, see STAR 10 19.

N72-28855 PC$7.75/MF$0.95
Boeing Co., Houston, Tex.
ORBITER ABORTS FROM BOOST PRESIMULATION REPORT.
H. D. Backman, and K. G. Brechka. 30 Jun 72, 113p NASA-CR-115715, REPT-5-2581-HOU-090
Contract NAS9-12183

Descriptors: *Aborted missions, *Computerized simulation, *Equations of motion, *Space shuttle orbiters, *Spacecraft launching, Abort trajectories, Automatic pilots.

For abstract, see STAR 10 19.

N72-28888 PC$3.00/MF$0.95
Vought Missiles and Space Co., Dallas, Tex.
ATMOSPHERIC RENDEZVOUS FEASIBILITY STUDY.
A. D. Schaezler. Jun 72, 114p NASA-CR-2040, REPT-00.1481
Contract NAS1-9994

Descriptors: *Rendezvous guidance, *Rendezvous spacecraft, *Space shuttle orbiters, *Space transportation, *Spacecraft recovery, Feasibility, Performance prediction, Spacecraft performance, Transport aircraft.

For abstract, see STAR 10 19.

N72-29838 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
OPTIMUM STRATEGY WHEN CORRECTING THE TRAJECTORY OF SPACECRAFT.
V. A. Ryasin. Aug 72, 19p NASA-TT-F-14383
Contract NASW-2035
Tran- Transl. Into English From the Publ. Upravleniye Kosmicheskimi Apparatami I Korablyami Moscow, Nauka, 1971 P 357-367

Descriptors: *Optimal control, *Spacecraft control, *Trajectory control, Differential equations, Equations of motion, Thrust vector control, Trajectory optimization.

For abstract, see STAR 10 20.

N72-29845 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MAXIMUM RANGE THREE-DIMENSIONAL LIFTING PLANETARY ENTRY.
E. D. Dickmanns. Aug 72, 53p NASA-TR-R-387, M-199
Subm- Sponsored in Part By Nas-nr

Descriptors: *Glide paths, *Gliding, *Reentry physics, *Space shuttle orbiters, *Spacecraft performance, Atmospheric entry, Mathematical models, Numerical analysis.

For abstract, see STAR 10 20.

N72-29880 PC$3.00/MF$0.95
Royal Aircraft Establishment, Farnborough (England).
THE ORBIT OF COSMOS 44, 1964-53A, FROM MARCH 1968 TO NOVEMBER 1970.
D. M. Walker. Aug 71, 18p RAE-TR-71161, BR-26779

Descriptors: *Computer programs, *Cosmos satellites, *Optical tracking, *Orbit calculation, *Satellite orbits, Geopotential, Orbit decay, Perigees, Satellite tracking.

For abstract, see STAR 10 20.

N72-29883 PC$3.50/MF$0.95
Royal Observatory, Edinburgh (Scotland). Satellite Tracking Section.

STOPWATCH OBSERVATIONS OF SATELLITES, APRIL 1972.
R. D. Eberst. 19 May 72, 26p ROE-STS-125

Descriptors: *Cosmos satellites, *Optical tracking, *Satellite tracking, Ablestar launch vehicle, Agena d rocket vehicle, Alouette 2 satellite, Astronomical coordinates, Explorer satellites, Magnitude, Midas satellites, Nimbus satellites, Ogo, Pageos satellite.

For abstract, see STAR 10 20.

N72-29084 PC$3.25/MF$0.95
Royal Observatory, Edinburgh (Scotland). Satellite Tracking Section.
STOPWATCH OBSERVATIONS OF SATELLITES, MAY 1972.
R. D. Eberst. 19 Jun 72, 21p ROE-STS-126

Descriptors: *Cosmos satellites, *Great britain, *Optical tracking, *Satellite tracking, Astronomical coordinates, Elektron 4 satellite, Explorer satellites, Nimbus 3 satellite, Ogo, Pageos satellite, Samos, Tables (data).

For abstract, see STAR 10 20.

N72-30584 PC$3.50/MF$0.95
TRW Systems Group, Redondo Beach, Calif.
DESIGN CONCEPT (MILESTONE 2) FOR SPACE VEHICLE ENTRY AND LANDING NAVIGATION PROGRAMS.
L. S. Diamant. 5 Mar 71, 28p NASA-CR-127912, TRW-5522.7-71-47
Subm- Sponsored By Nasa

Descriptors: *Computer programming, *Reentry trajectories, *Space navigation, *Spacecraft guidance, Digital navigation, Flow charts, Functional analysis, Spacecraft landing, Systems engineering.

For abstract, see STAR 10 21.

N72-30812 PC$4.75/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE EFFECTS OF TRACKING STATION COORDINATE UNCERTAINTIES ON GEOS-2 ORBITAL ACCURACY.
J. Glazer, and W. D. Kahn. Aug 72, 55p NASA-TM-X-65998, X-550-72-228

Descriptors: *Geos 2 satellite, *Minitrack system, *Orbit calculation, *Position (location), *Tracking stations, Error analysis, Lasers, Spacecraft orbits, Tracking (position).

For abstract, see STAR 10 21.

N72-30816 PC$18.75/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
GODDARD TRAJECTORY DETERMINATION SUBSYSTEM MATHEMATICAL SPECIFICATIONS.
W. E. Wagner, and C. E. Velez. Mar 72, 333p NASA-TM-X-65984, X-552-72-244

Descriptors: *Computerized simulation, *Equations of motion, *Orbit calculation, *Spacecraft trajectories, *Trajectory analysis, Mathematical models, Specifications, Trajectory optimization, Variational principles.

For abstract, see STAR 10 21.

N72-30818 PC$15.00/MF$0.95
Analytical Mechanics Associates, Inc., Seabrook, Md.
RELATIVE MOTION OF ORBITING SATELLITES.
J. B. Eades, Jr. 1972, 256p NASA-CR-112113, REPT-72-27
Contract NAS1-10907

Descriptors: *Aerospace environments, *Artificial satellites, *Orbital mechanics, Differential equations, Euler equations of motion, Linear equations, Numerical analysis, Orbital rendezvous, Two body problem.

For abstract, see STAR 10 21.

N72-30824 PC$4.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ON THE ANALYTIC LUNAR AND SOLAR PERTURBATIONS OF A NEAR EARTH SATELLITE.
R. H. Estes. Aug 72, 37p NASA-TM-X-66000, X-645-72-297

Descriptors: *Celestial mechanics, *Earth-moon system, *Perturbation, *Problem solving, *Trigonometric functions, Harmonic functions, Natural satellites, Trajectory analysis.

For abstract, see STAR 10 21.

N72-30825 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TRACKING COVERAGE OF THE RADIO ASTRONOMY EXPLORER-B.
H. Swartwood, Jr. Aug 72, 11p NASA-TM-X-65997, X-551-72-288
Subm- Submitted for Publication

Descriptors: *Parameterization, *Radio astronomy explorer satellite, Satellite tracking.

For abstract, see STAR 10 21.

N72-30827 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ATS C-2 SATELLITE VLBI EXPERIMENT.
J. Ramasastry, and B. M. Rosenbaum. Jun 72, 27p NASA-TM-X-66001, X-553-72-252

Descriptors: *Ats 3, *Interferometry, Doppler effect, Geodesy, Navigation aids, Spacecraft tracking.

For abstract, see STAR 10 21.

N72-30864 PC$8.75/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Center for Space Research.
SPACE SATELLITE DYNAMICS WITH APPLICATIONS TO SUNLIGHT PRESSURE ATTITUDE CONTROL.
Ph.D. Thesis
B. W. Stuck. 2 Aug 72, 135p NASA-CR-127869, CSR-T-72-2
Contract NGL-22-009-019

Descriptors: *Radiation pressure, *Rigid structures, *Satellite attitude control, *Solar radiation, Equations of motion, Nonrelativistic mechanics, Spacecraft design.

For abstract, see STAR 10 21.

N72-30892 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AN APPROACH TO ATTITUDE DETERMINATION FOR A SPIN-STABILIZED SPACECRAFT (IMP 1).
A. C. Fang. Aug 72, 31p NASA-TN-D-6925, G-1059

Descriptors: *Attitude indicators, *Computer programs, *Fortran, *Spin stabilization, Explorer 18 satellite, Linear equations, Satellite orientation, Telemetry.

For abstract, see STAR 10 21.

N72-30896 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
SONIC-BOOM GROUND-PRESSURE MEASUREMENTS FROM APOLLO 15.
D. A. Hilton, H. R. Henderson, and R. Mckinney. Sep 72, 36p NASA-TN-D-6950, L-8445

Descriptors: *Apollo 15 flight, *Pressure measurements, *Sonic booms, Atmospheric entry, Impulses, Overpressure, Spacecraft launching.

For abstract, see STAR 10 21.

N72-30903 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
FLIGHT-DETERMINED DERIVATIVES AND DYNAMIC CHARACTERISTICS FOR THE HL-10 LIFTING BODY VEHICLE AT SUBSONIC AND TRANSONIC MACH NUMBERS.
L. W. Strutz. Sep 72, 78p NASA-TN-D-6934, H-708

Descriptors: *Aerodynamic characteristics, *Hl-10 reentry vehicle, *Wind tunnel stability tests, Aircraft control, Correlation, Data acquisition, Stability derivatives.

For abstract, see STAR 10 21.

N72-30904 PC$5.25/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
A GENERAL PURPOSE MANEUVER TURNS COMPUTER PROGRAM.
G. I. Jaivin. 15 Aug 72, 63p NASA-CR-128027, JPL-TM-33-558
Contract NAS7-100

Descriptors: *Computer programs, *Vectors (mathematics), Command and control, Maneuverability.

For abstract, see STAR 10 21.

22D. Spacecraft Launch Vehicles and Ground Support

N72-28513 PC$21.75/MF$0.95
Planning Research Corp., Los Angeles, Calif.
DEVELOPMENT OF KSC PROGRAM FOR INVESTIGATING AND GENERATING FIELD FAILURE RATES. RELIABILITY HANDBOOK FOR GROUND SUPPORT EQUIPMENT.
Final Report
C. E. Bloomquist, and R. H. Kallmeyer. 24 May 72, 391p NASA-CR-127580, PRC-R-1459
Contract NAS10-7621

Descriptors: *Failure analysis, *Ground support equipment, *Reliability engineering, Cape kennedy launch complex, Component reliability, Confidence limits, Failure modes.

For abstract, see STAR 10 19.

N72-30246 PC$13.25/MF$0.95
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
THE DEEP SPACE NETWORK, VOLUME 10.
Progress Report, May - Jun. 1972
15 Aug 72, 255p NASA-CR-127762, JPL-TR-32-1526-VOL-10
Contract NAS7-100

Descriptors: *Deep space network, *Management planning, *Research and development, Project management, Space communication, Space flight, Spacecraft tracking.

For abstract, see STAR 10 21.

N72-30248 PC$14.00/MF$0.95
Avco Government Products Group, Lowell, Mass. Systems Div.
DYNAMIC LOAD SIMULATOR.
Final Report, 24 Jun. 1971- 24 May 1972
K. P. Joncas. 23 Jun 72, 237p NASA-CR-115760, AVSD-0076-72-RR
Contract NAS9-12016

Descriptors: *Electric equipment, *Electrical properties, *Simulators, *Test facilities, Electric networks, Spacecraft electronic equipment, Systems engineering.

For abstract, see STAR 10 21.

N72-30388 PC$5.25/MF$0.95
Lockheed Missiles and Space Co., Huntsville, Ala. Research and Engineering Center.
ELECTROMAGNETIC DAMPER SYSTEM FOR GROUND WIND LOAD STUDIES.
Final Report
L. P. Scott. May 72, 61p NASA-CR-123797, HREC-6674-1
Contract NAS8-26774

Descriptors: *Saturn 1 launch vehicles, *Skylab program, *Structural design, *Vibration isolators, *Wind tunnel models, Aeroelasticity, Dampers, Ground wind, Loads (forces), Wind tunnel stability tests.

For abstract, see STAR 10 21.

N72-30893 PC$5.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
LAUNCH VEHICLE SYSTEM REQUIREMENTS AND RESTRAINTS FOR THE ERTS-A SPACECRAFT.
J. F. Corrigan. Jul 71, 70p NASA-TM-X-65983, X-430-71-305
Contract PROJ. ERTS

Descriptors: *Delta launch vehicle, *Earth resources technology satellite a, *Preflight operations, *Spacecraft launching, Earth resources program, Launching bases.

For abstract, see STAR 10 21.

N72-30895 PC$27.50/MF$0.95
Boeing Co., Huntsville, Ala.
SATURN BASE HEATING HANDBOOK.
Final Report
C. R. Mullen, R. L. Bender, R. L. Bevill, J. Reardon, and L. Hartley. 1 May 72, 506p NASA-CR-61390, TD-050
Contract NAS8-5608

Descriptors: *Heat balance, *Heat generation, *Heat measurement, *Saturn launch vehicles, Data acquisition, Handbooks, Spacecraft design, Thermodynamic properties.

For abstract, see STAR 10 21.

N72-30898 PC$6.50/MF$0.95
Stanford Research Inst., Menlo Park, Calif.
MEASUREMENTS IN ATMOSPHERIC ELECTRICITY DESIGNED TO IMPROVE LAUNCH SAFETY DURING THE APOLLO SERIES.
Final Report
J. E. Nanevicz, E. T. Pierce, and A. L. Whitson. Jun 72, 87p NASA-CR-115754
Contracts NAS9-11357, SRI PROJ. 8940

Descriptors: *Apollo flights, *Atmospheric electricity, *Electrical measurement, *Safety, Cloud cover, Electric fields, Lightning, Spacecraft launching.

For abstract, see STAR 10 21.

N72-30899 PC$11.00/MF$0.95
General Dynamics/Convair, San Diego, Calif.
UMBILICAL CONNECT TECHNIQUES IMPROVEMENT-TECHNOLOGY STUDY.
Final Report, 1 Jul. 1971 - 2 Jun. 1972
D. C. Valkema. 2 Jun 72, 176p NASA-CR-127816
Contract NAS10-7702

Descriptors: *Ground support systems, *Space shuttles, *Umbilical connectors, Disconnect devices, Liquid hydrogen, Liquid oxygen, Saturn 5 launch vehicles, Specifications.

For abstract, see STAR 10 21.

REPORT LOCATOR LIST

This list comprises all the reports cited in this issue. It is arranged alpha-numerically by accession number. The subject field and group where the report citation can be located in the journal precedes the accession number.

All of the reports announced in this issue are indexed by corporate author, subject, personal author, contract number, and accession/report number in the companion index **Volume 72, Number 24.**

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1 AERONAUTICS

2 AGRICULTURE

3 ASTRONOMY AND ASTROPHYSICS

4 ATMOSPHERIC SCIENCES

5 BEHAVIORAL AND SOCIAL SCIENCES

6 BIOLOGICAL AND MEDICAL SCIENCES

7 CHEMISTRY

8 EARTH SCIENCES AND OCEANOGRAPHY

9 ELECTRONICS AND ELECTRICAL ENGINEERING

10 ENERGY CONVERSION (NON-PROPULSIVE)

11 MATERIALS

12 MATHEMATICAL SCIENCES

13 MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

14 METHODS AND EQUIPMENT

15 MILITARY SCIENCES

16 MISSILE TECHNOLOGY

17 NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

18 NUCLEAR SCIENCE AND TECHNOLOGY

19 ORDNANCE

20 PHYSICS

21 PROPULSION AND FUELS

22 SPACE TECHNOLOGY

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